

The University of Chicago

MANUFACTURAL EVANSVILLE
1820-1933

A DISSERTATION SUBMITTED TO THE FACULTY
OF THE DIVISION OF THE PHYSICAL SCIENCES
IN CANDIDACY FOR THE DEGREE OF DOCTOR
OF PHILOSOPHY

DEPARTMENT OF GEOGRAPHY
AUGUST, 1947

By
BERNARD H. SCHOCKEL

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PREFACE

This dissertation was begun in 1933 and completed in 1947. The uncommonly long period of gestation permitted the work to pass through several forms.

The field work was done in 1933, and a major portion of the library and office work occurred at Chicago during the period, 1933-1934. Much of the original draft of some four hundred pages was written in 1935, while the author was employed by the Tennessee Valley Authority. The depression and other circumstances intervened and when work on the dissertation was resumed, in the early 1940's, its scope and objectives were enlarged--in quest of deeper insight and basic principles. The project then became a study of the evolution of Manufactural Evansville from 1820 to 1933. Emphasis is placed upon the 1933 period because the major field study was made at that time and that period marked pronounced and basic changes in Manufactural Evansville.

The historical research entailed in studying the century of growth of Manufactural Evansville preceding 1933 was done mainly in the State Library of Indiana, and the city libraries of Aurora, Evansville, and Cincinnati. The dissertation was then recast, the statistical tabulation completed, and the maps and graphs augmented. Subsequently the manuscript was rewritten, and later was advanced to its present form.

Attention is now invited to the matter of acknowledgments. Since this work is an abridgment of a larger (unpublished) effort, acknowledgment pertains to both.

Two kinds of assistance are acknowledged: the indirect assistance cited, at appropriate places, by footnotes; and, herein, the direct assistance customarily cited in a preface.

The footnotes, heretofore mentioned, are not references to specific publications. They acknowledge techniques, philosophies, and fields of endeavor, each emphasized by the workers cited, who, through their work have indirectly aided the present effort greatly. Acknowledgments pertaining to tables, maps and photographs appear either directly under the illustration or in

the legends appearing in Appendix II. Many of the maps and photographs are original, as are many of the tables, with their burden of responsibility. Commonly they can be recognized as such by means of citation to primary sources. Modified tables and non-original ones carry reference to the published source.

Complete acknowledgment of direct assistance would involve mention of hundreds of persons. It is hereby gratefully rendered to all of those persons, although only a few are named.

Almost every member of the staff of the Department of Geography of the University of Chicago, 1930-1947, rendered outstanding assistance, scarcely possible to apportion.

At Evansville a number of institutions, and members thereof, rendered significant assistance. Among them were: The Chamber of Commerce, the Manufacturers Association, the City Plan Commission, the newspapers, the Library, and the offices of the City Engineer and the Recorder; in addition, the offices of numerous transportation companies; and, finally, upwards of two hundred manufactural firms.

Acknowledgment, by name, is made of the assistance of four persons: Wallace Culp, in certain phases of field work at Evansville; Bernard H. Rullman, in field work and drafting; Miss Louise Waldruff, in office work and drafting; and, finally, Mrs. Mildred Vernon, in conversion, by typing, of the copy to standard form.

July 15, 1947

Bernard H. Schockel
Aurora, Indiana

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CHAPTER I

STATUS AND FEATURES

This dissertation is a study of the evolution of manufacturing in Evansville, Indiana, from 1820 to 1933, with emphasis upon the period, 1929-1933. During this long period, the economic role of manufacturing in Evansville advanced from one of insignificance to predominance, so that by 1929 about thirty seven per cent (16,000) of the gainfully employed persons of the city (total population: 102,000) were employed in its factories. Moreover, during the period, 1933-1947, both the manufacturing and the manufacturingness of Evansville net-increased at an accelerated rate.

The treatise deals with five major aspects of the manufacturing component of Evansville, namely: The status and features of the manufacturing as of 1933, when the field work was done; the setting of Evansville and her manufactural component (herein termed Manufactural Evansville); the evolution of Manufactural Evansville; the deployment, alignment, and districts of the plants; and, finally, the manufactural trade pattern. The major conclusion reached is that there is discernible (and largely mappable) order inherent in the growth and pattern of Manufactural Evansville. This order permeates the local, regional, and national aspects of manufacturing in Evansville, and the inter-relationships which tie them together.

Section 1. Facets of Status and Features

The first chapter deals with the status and features of Manufactural Evansville, by means of a number of facets thereof and by means of a composite portrayal. The picture is focussed for the early 1930's; but there is explanatory background as of earlier times. The composite portrayal is an attempt to integrate the several facets treated.

Portrayal by Federal Bureaus

In their manufactural data, the Federal bureaus reveal a number of aspects of Manufactural Evansville as of the early nineteen-thirties. Thus one learns from the Bureau of Domestic Commerce¹ that Manufactural Evansville was important, viewed nationally. In 1929 she accounted for about nine-tenths of the manufacturing in Vanderburg County, which county was among the one hundred fifty counties of the United States which together were credited with seventy-five per cent "of all the manufacturing activities in the country, as measured by cost of materials, supplies, and purchased electrical energy."

By means of comparison it was ascertained, from customary manufactural data provided by the Bureau of the Census, that for a city of 100,000 population Evansville stood a bit high in certain items pertaining to manufacturing. These were (1) number of establishments: 212 in 1929, and 180 in 1931, but only 152 in 1933 (great economic depression); (2) gross value of products: 90.8 million dollars in 1929, and 59.4 in 1931, but only 21.2 in 1933; (3) number of manufactural wage earners: 13, 981 in 1929, and 10, 245 in 1931, but only 9,700 in 1933; and (4) number of persons gainfully employed in manufacturing: 15,912 in 1929, and about 11,500 in 1931, but only about 11,000 in 1933. The occupation figures were about 13,300 and 15,500 for 1939. But Evansville stood a bit low in the item, value added in the process of manufacturing (manufactural increment): 41.6 million dollars in 1929, and 30.5 in 1931, but only 21.2 in 1933. Finally, Manufactural Evansville stood decidedly low in the price of coal.

The two glimpses are worth restatement. Manufactural Evansville is not obscure--a happy circumstance. But more significant in analysis are (1) the low price of coal, which is of foundation importance, and (2) the relatively somewhat low manufactural increment, which has been of great significance.

¹Charles B. Eliot, Manufacturing Market Statistics, Domestic Commerce Series--No. 67 (Washington: United States Government Printing Office, 1932), p. 7.

Inscribed in the Landscape

What were the spatial dimensions of Manufactural Evansville--the quantities of grounds, buildings, and floor space?

The total manufactural acreage mapped, as of 1933, was approximately 660 (Fig. 1), of which 490 acres were developed whereas 170 acres were undeveloped, but held for manufactural use in the future. This total acreage included 197 developed manufactural grounds and three undeveloped tracts (Fig. 2). Some of the developed grounds were of plants wholly or largely inoperative, owing mainly to the great economic depression of the nineteen-thirties. This total manufactural acreage constituted most of the manufactural element in the land use pattern of Evansville. For practical and investigative reasons, certain grounds were not mapped as manufactural, i.e., (1) establishments with annual products totalling less than \$5,000; (2) manufactural retail shops, such as bakeries; (3) manufactural service shops, such as laundries; and (4) manufactural plants engaged mainly in commercial processing, such as the cleaning and packing of seeds. The total ground space of buildings on the mapped grounds was approximately 169 acres, the total gross floor space, about 259 acres (Fig. 3). The yards totalled upwards of three hundred acres and they included considerable permanent, operative fixtures, some of which were mapped. These spatial items constituted the chief real estate of Manufactural Evansville, the substantial "home" inscribed in the landscape (Figs. 4-10 inclusive)--to use a phrase emphasized by Wellington D. Jones and V. C. Finch.

Variety of Products

An outstanding feature of Manufactural Evansville has been its marked variety in products, in view of the fact that Evansville is a city of 100,000 population.

The diversity is evident in the fact that each of the sixteen classes of manufactures devised by the Bureau of Census¹ was represented in 1929 by one or more factories in Evansville (Table 1).

¹Bureau of the Census, Census of Manufactures, 1929. Industry Classifications for the Census of Manufactures, 1929 (Washington: United States Government Printing Office, 1930), p. 15.

TABLE 1
CLASSES OF FACTORIES^a

Manufactural Class		Number of Factories ^b										
		1860	1874	1880	1890	1898	1921	1925	1927	1929	1931	1933
1.	Food and kindred products.	22	14	22	47	38	21	79	51	45	39	36
2.	Textiles and their products.	1	11	3	10	10	9	9	9	7	5	7
3.	Stone, clay, and glass products. . . .	13	17	16	15	14	9	21	19	22	19	18
4.	Printing, publishing, and allied industries.	4	3	8	11	10	7	22	16	18	16	17
5.	Iron and steel and their products, not including machinery.	6	16	15	50	13	10	27	18	15	14	13
6.	Nonferrous metals and their products. .	1	6	4	3	3	3	16	16	11	7	8
7.	Forest products.	25	41	23	62	59	47	75	56	52	44	39
8.	Machinery, not including transportation equipment.	4	5	9	15	15	16	16	13	18	18	16
9.	Transportation equipment; air, land, and water.	4	8	13	13	12	9	12	7	7	3	2
10.	Chemicals and allied products.	2	13	6	6	11	3	11	7	8	8	8
11.	Paper and paper products.	1	1	1	1	1	1	1	1	1	1	1
12.	Electricity and products of petroleum and coal.	1	1	1	2	3	3	5	3	3	3	3
13.	Rubber products.	0 ^b	0	0	0	0	1	1	2	2	2	2
14.	Leather and its manufactures.	2	15	11	28	7	6	7	5	5	1	1
15.	Railroad repair shops.	0	1	2	2	3	3	3	4	4	3	2
16.	Miscellaneous.	5	11	18	45	14	19	16	16	18	16	8

^aData are based chiefly upon reports of the Bureau of the Census, Evansville city directories, insurance maps, local histories, information from the Evansville Manufacturing Association, field mapping, and interviews.

^bThe evolution of the number of manufacturing plants in Evansville is presented by Classes, classified according to the Bureau of the Census, Industry Classification for the Census of Manufac-

tures 1929 (Washington: Government Printing Office, 1930), p. 2. The table reflects well the constitution of Manufactural Evansville, hints something of the fortune of each Class; but it is somewhat confusing quantitatively in that neither numbers of wage earners nor values of products are presented, and in the fact that for some years small factories and commercial processing firms have been eliminated more completely than for other years. A factory which produced items in two Classes, or more, is represented in them. Therefore the total of factories for each year is not the sum of the array.

^cIncludes cigars and other tobacco, brooms, mattresses, laundries, etc.

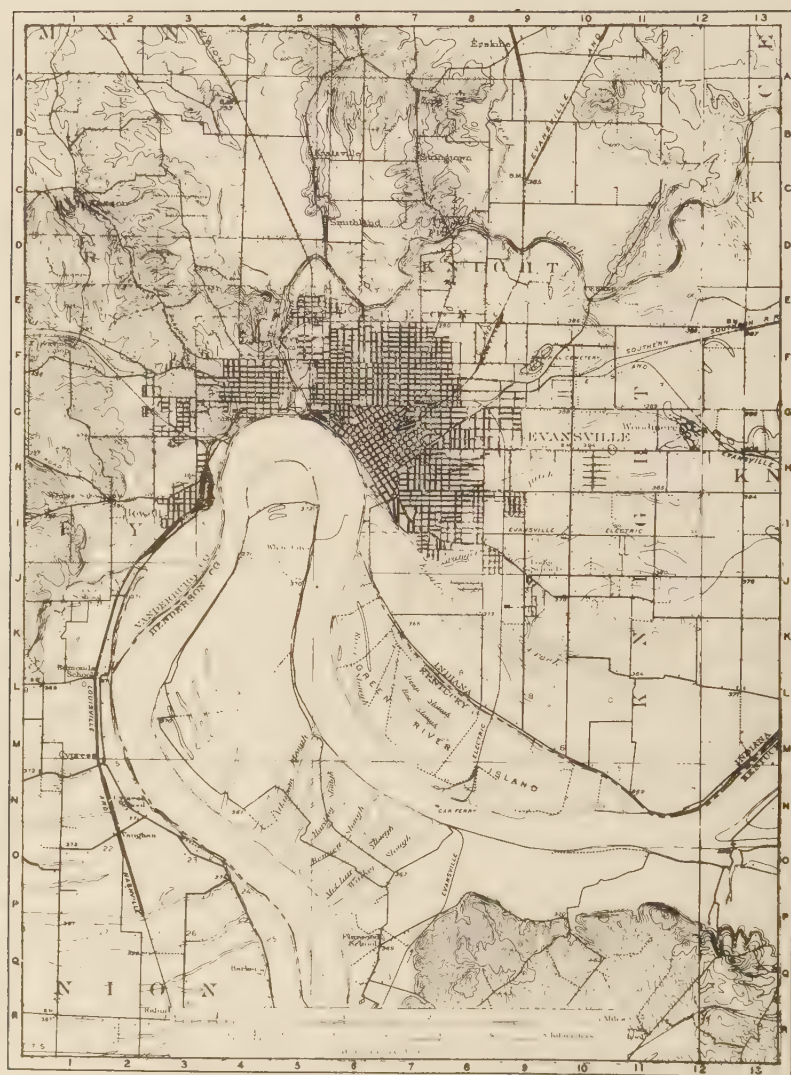


Fig. 4.--Topographic map of Evansville and vicinity.
Compare with Figure 5.



Fig. 5.--Pictorial relief map of Evansville and vicinity.
See Fig. 4 and Appendix II.



Fig. 6.--View south from tower of the court house. For description see Appendix II



Fig. 7.-- View west from tower of the court house. For description see Appendix II.



Fig. 8.--View east from tower of the court house. For description see Appendix II.



Fig. 9.--View northeast from tower of the court house. For description see Appendix II.



Fig. 10.--View north-northwest toward the plant of Igleheart Brothers Incorporated, in manufactural District F. The plant can be identified by means of the huge elevators for storage of wheat. In the foreground, from left to right, are the plants of the Schelosky Table Company, Servel Incorporated (refrigerator storage), and the Klammer Goebel Furniture Company. In the right background is the plant of the Well Packing Company. South and southwest of it are, respectively, the factories of the Von Behren Manufacturing Company, and the United States Furniture Company. Pigeon Creek is shown to be at moderate flood stage. (Permission Aero-Graphic Corporation.)

Moreover, Evansville plants are represented in all sixteen of the classes of that classification, for the period, 1921-33, also in fifteen of such classes for the period, 1874-1900, and in fourteen of such divisions for the year, 1860. Earlier than 1860 there was representation in many of such sixteen classes.

The multiform trait of Manufactural Evansville's production is also inherent in the author's classification¹ of manufactured products of Evansville into nine manufactural Groups, as of 1929 and 1932 (Table 2); the smallest Group had five plants, and the largest group had fifty-nine. Evansville plants had representation in each of the nine Groups throughout the period, 1860-1933, and they had representation in many of the Groups at earlier dates.

Additional portrayal of the divers products under discussion is presented in Figure 11 in which destinations of the Crescent City's manufactured products, as of 1933, are depicted by map-diagram. Thirty-one outstanding manufactural products are among those treated distributionally; some of these items represent each as many as ten sub-items, e.g., furniture, boxes, steel and iron, and agricultural implements. In view of such variety in production as has been asserted herein, it might be anticipated that there was variety in buildings and grounds--the gross means of production. Such was the case in 1933. There was variety in size and unity (uninterruptedness) of grounds; variety in size and story-type of buildings; and there were divers building-yard patterns. Such diversity in means was, of course, not wholly due to diversity in function; however, some correlation was found, but statements of details are hereby deleted.

How to account for Manufactural Evansville's century of variegated production? It was an outgrowth of a combination of factors, among the major ones being: local needs; an unusually large wholesale area because Evansville is distant from its ring of rival, peer-cities, which long encountered difficulties of transportation in her whole sale area; Evansville's erstwhile

¹Numerous schemes for the classification of Evansville manufactures were tried, but none proved to be wholly satisfactory. This classification, based upon materials used in manufacturing, was employed because it seemed to be the least unsatisfactory for the ends in view.

TABLE 2
MANUFACTURAL GROUPS^a

Products Made Largely of:	Wage Earners		Order of Rank		Plants Mapped 1933
	1929	1932	1929	1932	
1. Wood.	5,001	1,608	1	2	59
2. Metals and alloys . . .	4,519	3,643	2	1	39
3. Tobacco	2,500	1,507	3	3	6
4. Food materials.	1,121	1,105	4	4	33
5. Coal, stone, sand, clay	581	302	5	6	16
6. Textiles, cloth, leather	576	1,056	6	5	12
7. Paper, printing	231	177	8	8	15
8. Chemicals	46	43	9	9	5
9. Other materials	394	275	7	7	12
Total	14,969 ^b	9,716 ^c	..	..	197

^aAn original classification, 1934.

^bThe total for 1929 differs from that of the Bureau of the Census (13,981); but the figures were gathered with care from the manufacturers and were checked in various ways.

^cIncludes part-time workers. The Census figures for 1931 are 10,245.

large and long-lived entrepot trade--early rivered (and later, river-railed) into and from the South; multiform needs of the Deep South, to which Evansville was an Ohio River gateway; and rivered (and later, railed) materials from the Northeast, and north of the Ohio River. Also, Manufactural Evansville started, and habituated for three-quarters of a century (1820-1900), when specialization was not the mode.

Trade Currents and Flow

The main currents and the main flow (quantity) of Manufactural Evansville's trade have been, throughout her career, in the province athwart the United States between the Mississippi River and the Appalachian Mountains, with slight extensions to the southwest and northeast. The line of the Ohio River divides the province significantly: from the northern part has inflowed always most of her supplies; to the southern one outflowed most of her products, until the nineteen-twenties--by the 'thirties a slight

DISTRIBUTION OF MANUFACTURED PRODUCTS OF EVANSVILLE
 MOST ITEMS OF RELATIVELY MINOR IMPORTANCE OMITTED

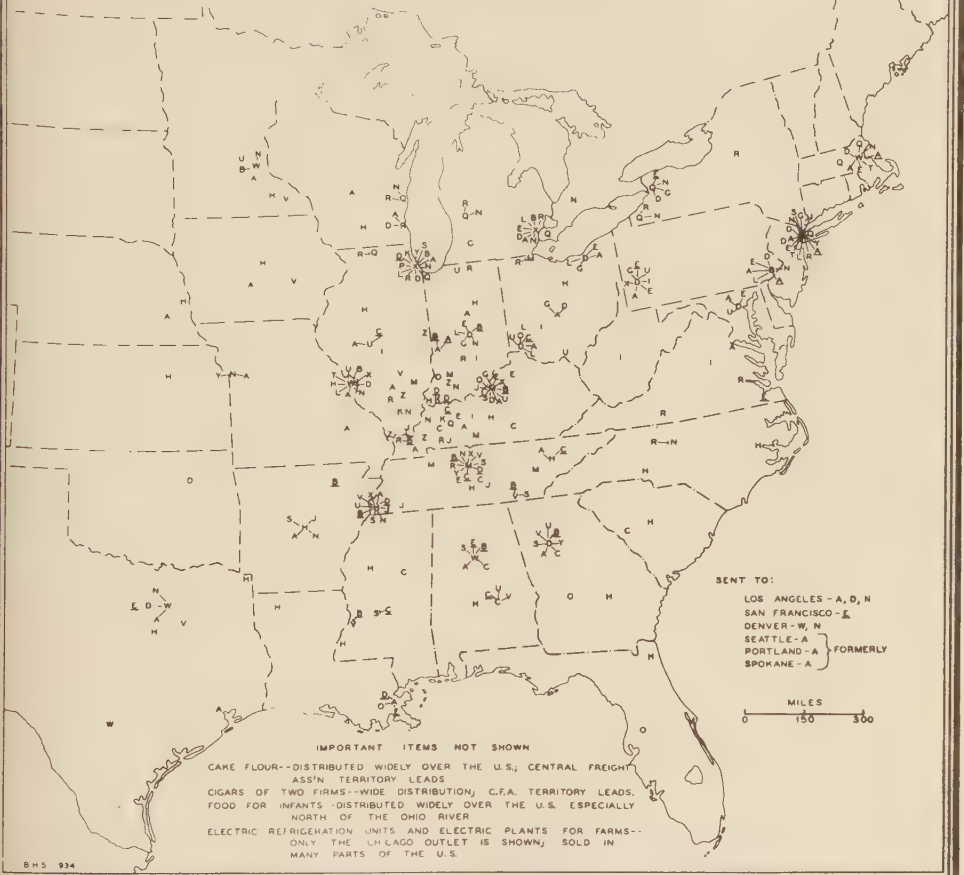


Fig. 11.--Distribution of manufactured products of Evansville. For key to Fig. 11 turn to Appendix II.

overall ascendancy had passed northwards of that line.

Inflow.--With respect to inflow, at the opening of the nineteen-thirties about one per cent of Manufactural Evansville's manufactural wage earners worked in such factories as obtained as much as 60 per cent of their materials in Evansville. About six per cent were of plants which purchased such a portion in the Evansville Tri-State Area minus that city (Fig. 12). Approximately 93 per cent were of establishments which secured upwards of 60 per cent of their materials from beyond the Evansville Tri-State Area (Fig. 13). A relatively minor quantity of materials, perhaps as much as two per cent, was received from overseas, Canada, plus our west coast.

Evansville manufactories received all of their water locally and almost all of their coal from an area having a radius extending about sixty miles from that city. In 1933 about eighty mines in this area sent coal to Evansville (Fig. 14). A small amount of coal which is of higher grade than that produced locally, was obtained from the coal fields of Virginia and eastern Kentucky. Natural gas was piped to Evansville from Francisco, about twenty-five miles northeast of the Crescent City. The proximity of the sources of coal was of major importance to Manufactural Evansville: it assured abundant quantities in general at relatively low prices, even considering the fact that the quality was a bit low. It anchored the supply pattern and foundationed manufacturing.

Highly significant is the fact that there had been recession in the specific sources of some of the major supply items, with no corresponding recession in the destination of the sales items in the sense that she had not lost her nearer sales markets as she had expanded the dimensions of her sales pattern. The significance grew out of the nature of her manufactural pattern--with exceptions, a pattern with manufacturing emphasis placed upon materials, i.e., a somewhat low percentage of manufactural increment, with resultant reliance placed upon a large output of products which were good as of their price-class, but were not highest-price class. Accordingly, since the emphasis in the manufactural pattern was largely on materials, serious recession in their sources would bring about stresses eventually, approximately in the later phases of the stage of maturity of the manufactural trade pattern.

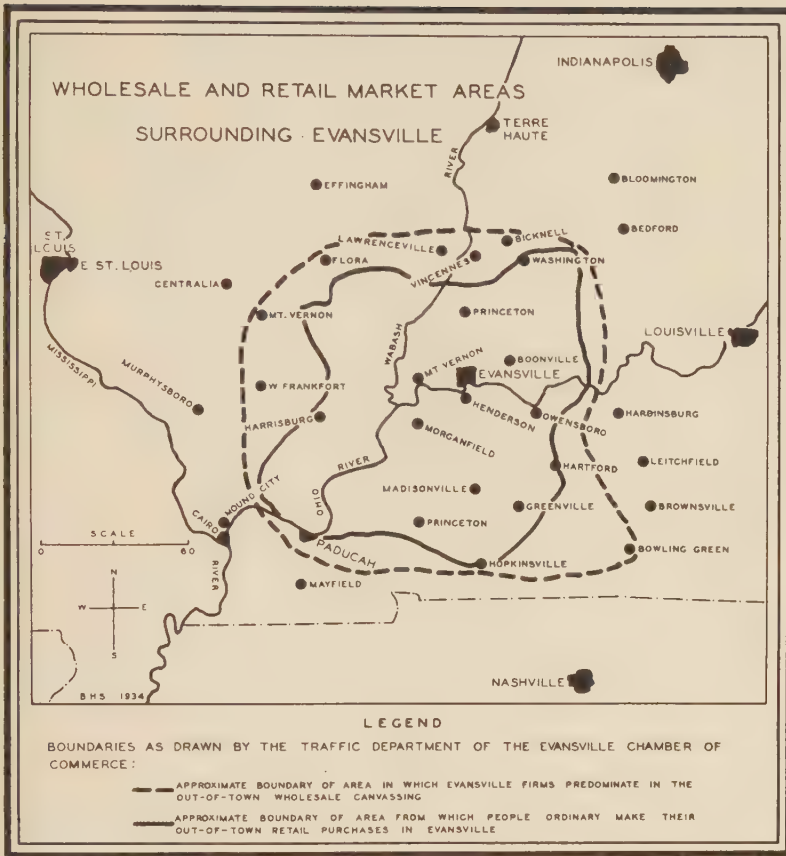


Fig. 12.--Wholesale and retail market areas surrounding Evansville. Improvement of highways has been accompanied by an increase in the retail market area and a decrease in the wholesale market area.

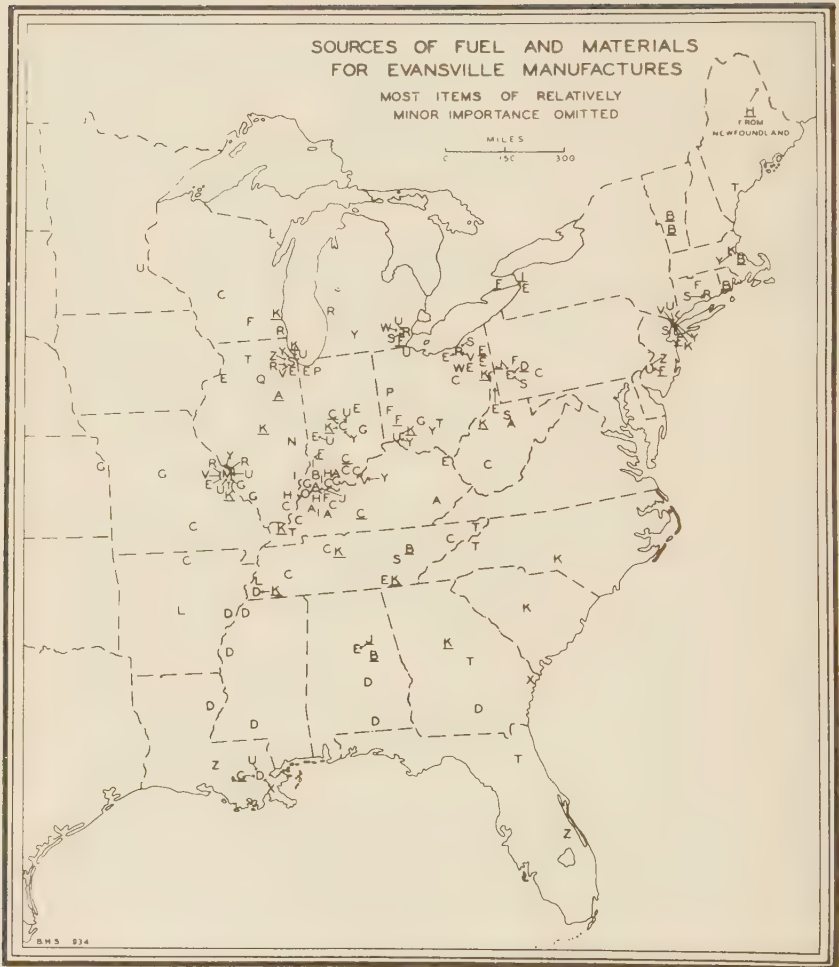


Fig. 13.--Sources of fuel and materials for Evansville manufactures. The chief source is the territory of the Central Freight Association, followed by that of the Southern Freight Association. For key to Fig. 13, turn to Appendix II.

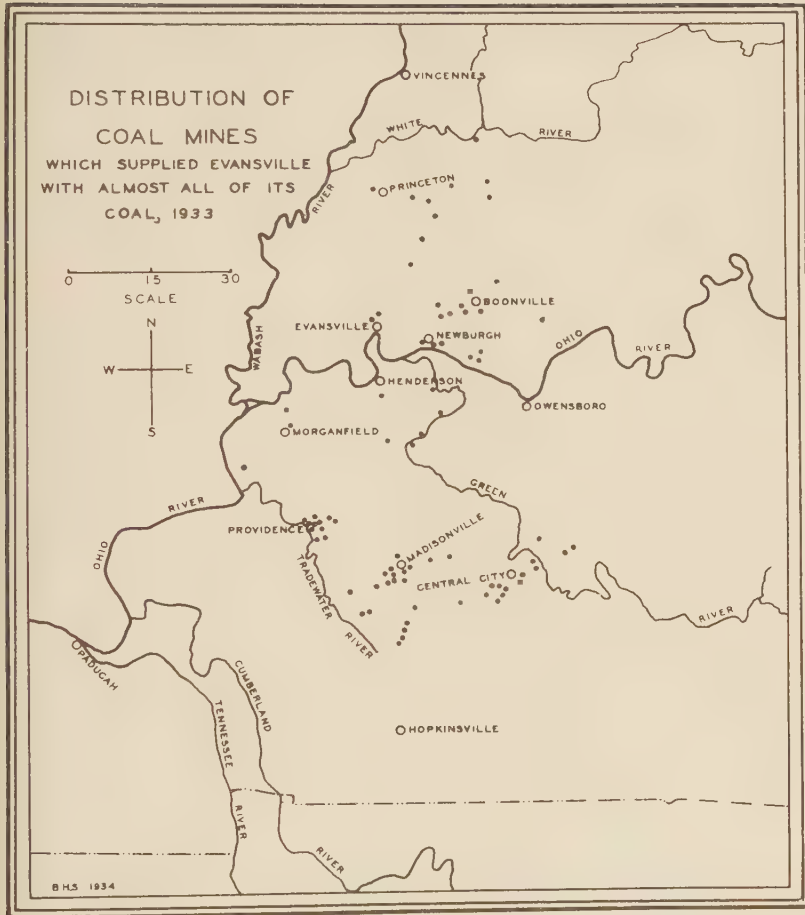


Fig. 14.--Distribution of coal mines. They supplied Evansville with almost all of its coal, 1933. (Based upon data from railroads, coal operators and other sources.)

Such stresses could be met, in part at least, by a change in manufacturing emphasis. Indeed some of the factories had already solved the problem in such fashion.

Outflow.--With respect to outflow, about eight per cent of the manufactural wage earners worked in such of her factories which disposed of as much as 60 per cent of their products in Evansville. Approximately two per cent were of plants which sold chiefly in the Evansville Tri-State Area minus the city. About 90 per cent were of establishments which sent upwards of 60 per cent of their manufactures beyond the Evansville Tri-State Area. Some three per cent of her products were exported, and a small amount moved to our west coast.

In one respect the destination of the outflow was undergoing an important change. Sales difficulties were mounting in the South in a number of lines, and some of those lines accordingly were engaged in penetrating the North, or in increasing in the North the percentage of their outflow, especially in the Northeast. The outflow into the South was still large, but relatively smaller than the erstwhile flow. Among the major associated factors were: (1) the rise of manufacturing in the South, e.g., stoves, foundries, furniture, and textiles; (2) wide-spread economic depression in the South; (3) loss, in part, of Evansville's advantages as an Ohio River gateway; and (4) rise and increase in Manufactural Evansville of factories producing higher-price class goods, for which there was more favorable market elsewhere. The manufacturing emphasis in the manufactural pattern was incipiently changing.

Facets Exhibiting Discernible Order

In some facets Manufactural Evansville has exhibited discernible order, especially in its growth, land use pattern, and manufactural pattern, to each of which is devoted a chapter in this treatise (Chapters III, IV and V), with only introductory citation in this sub-section.

Order in growth.--From some points of view, Manufactural Evansville has evolved--changed gradually from a simple stage to more complex ones. It has experienced youth and some phases of maturity, and in the early nineteen-thirties appeared to exhibit a few slight hints of incipient old age--to use a term with no

derogation. It experienced interrupting rejuvenation, especially incidental to the Civil War, and World Wars I and II. Depressions have retarded its growth to levels which proved to be only temporary. Perhaps the career of Manufactural Evansville has been basically self-impelled (by her men); but certainly, in addition she has performed more or less in line with changes in her setting. Thus her emphasis in manufactural sales has shifted: from local needs to needs of the South and then to needs of the North, in line with discernible circumstances. Changes in the setting have been sours. Whence arose necessity for the chapter on the setting --Chapter II.

In details there have been changes not wholly due to sheer volition and, or, chance. Sawmilling rose to great heights and then declined as local supplies of hardwoods waned; but the associated planning-mill industry was still vigorous in the nineteen-thirties, as was its associated industry, materials and manufactured parts for houses and other structures. Sawmilling encouraged cabinet-making by hand, which mutated into a large furniture category, which in turn sprouted radio cabinets and mothered mirror plating, and stimulated the manufacturing of mattresses. Under one composite roof of a large factory there has been a gamut--from wood-working to carriages and wagons, to automobile bodies, music and ice boxes and radio cabinets, and then to refrigerators; under the same roof farm wagons encouraged engines for farms, which mutated into automobile engines, and then electric and gas refrigerators. Potteries became producers of tablewares, and vitrified wares for bathrooms. Early forms of iron work and tinnery grew into the steel counterpart of the cited wood-construction industry. (One somehow expects the advent of a mutation to air-conditioning for houses; it probably would be "a natural" because of decades of basic experience.) Leathers, such as harness, flourished and declined; but there are textiles, clothing, and canvas dropcloths for painters. Canvas supplies and whatnots for boats developed a strain known as tents and awnings. There was a cycle from flour-mills to cake flour, to food for infants, to soya flour. Slaughter houses preceded meat packing which preceded produce packing. Pipe tobacco and wholesale trade in cigars preceded the large cigar manufactures. An interesting chapter on the evolution of specific

industries was prepared for insight and then deleted to escape weight of detail.

Order in the land use pattern.--The manufactural land use pattern as of the early nineteen-thirties showed some striking phases of discernible order as related to locality in the city of Evansville, specifically as related to its inner parts (downtown and near-downtown) and its outer parts. By means of (unpublished) maps of the distribution of plants by decades, this kind of orderliness was traced back as far as the eighteen-fifties. In addition, the pattern exhibits another striking kind of orderly arrangement, i.e., in line with transportation ways. There are vestiges of a once strong alignment with the Ohio River and its local tributary, Pigeon Creek, which alignments, as of earlier days, has been brought into strong relief by means of the cited maps. The major alignment in the early nineteen-thirties was with the railroad pattern, highly striking because the railroad pattern arrests attention. Finally, there were eight persistent and fairly distinctive manufacturing districts (Figs. 2, 15 and 16); also, there is evidence that the manufactural land use pattern evolved.

Order in the manufactural trade pattern.--In the search for discernible order in manufactural patterns, perhaps most elusive has been correlation within the manufactural trade pattern, largely owing to paucity of data and, or, maze of minutia, plus a necessarily costly amount of statistical work. It was exciting, therefore, to see a half-dozen correlations, chiefly with the element of distance. Of which more anon in Chapter V. There is evidence also that the manufactural trade pattern has evolved, and exhibited, in the early nineteen-thirties, maturity with slight heralds of incipient old age.

Portrayal by Indices

Not only is the index a brief means of measurement, it also serves as a manner of comparative portrayal. A number of indices are herein thus used.

1. Manufacturingness of Evansville.--To what degree has Evansville concentrated upon manufacturing, i.e., what has been her manufacturingness? What has been the comparative role of the component, Manufactural Evansville, in the city of Evansville?

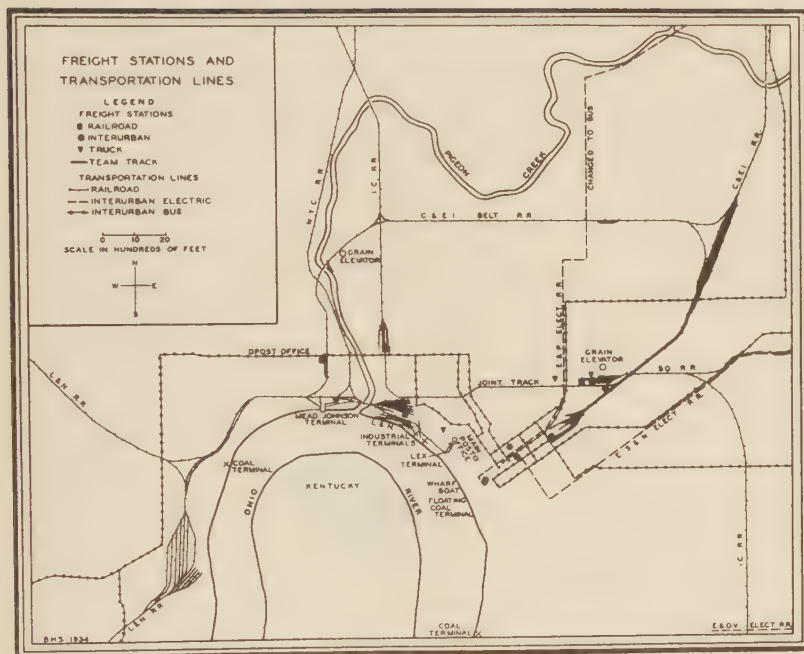


Fig. 15.--Freight stations and transportation lines.

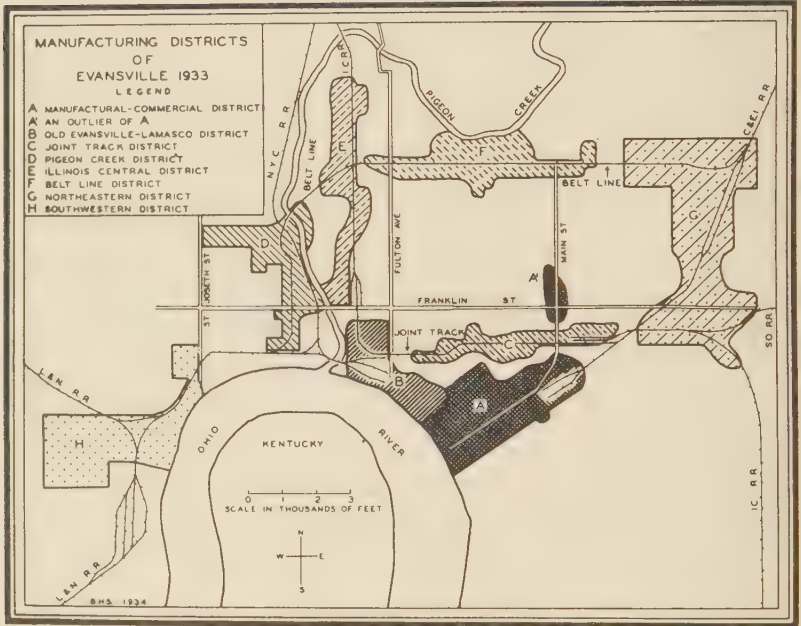


Fig. 16.--Manufacturing districts of Evansville 1933. There is a close relation between the pattern of the districts and that of the railroads, especially the Railroad Ellipse. District A is the oldest, and District H the youngest.

In part the question can be answered in terms of performance per unit, as of 1929. The ratio of the item, value added by manufacturing, to the item, developed manufactural acreage, i.e., the value per acre, was \$84,793. The ratio of the item, value added by manufacturing, to the item, number of persons gainfully occupied in manufacturing, i.e., the value per manufacturing person, was \$2,617. The ratio of the item, value added by manufacturing, to the item, population of the city, i.e., the value per citizen, was \$407.00. Other pertinent ratios are stated in tables in Appendix I.

In part the question can be answered by comparing Evansville with cities of her class. In 1929 there were in the United States some 72 cities aligned with Evansville in one or more of the following items (but complete statistics were available for only 29): population; number of persons gainfully occupied in the city; number of persons gainfully occupied in manufacture; number of manufactural wage earners; total cost of materials and containers; total cost of fuel and purchased energy; total manufactural wages; value added by manufacturing. Now in the item, number of persons gainfully occupied in manufacture compared to the number of persons gainfully occupied in the city, Evansville's percentage of the mean of the group of 29 cities was 121; its simple rank was ninth; its percentile rank was 70. Moreover in the item, number of persons gainfully occupied in manufacture compared to the total population of the city, Evansville's percentage of the mean of the group was 117; her simple rank, eleventh; her percentile rank, 63. From the preceding two statements it is seen that Evansville concentrated upon manufacturing more than did the composite of the 29 cities.

In part the question can be answered in terms of a mongrel geometric mean, a manufactural index of Evansville in abstract units, which is useful although it probably could not move in mathematical society. The index was ascertained by calculating the mongrel geometric mean of the following items (and subsequently dividing it by 100): (1) value added by manufacturing; (2) the value added by manufacturing per manufactural acreage; (3) the value added by manufacturing per citizen. The resulting index is the abstract number, 408, the mongrel geometric mean, useful only if such indices of other cities were known.

2. Manufacturing momentum.--A quality auguring favorably for the future of Manufacturing Evansville is its healthy manufacturing momentum. It has been notably steady each decade since 1870, as evidenced by the following facts. (1) The population of Evansville has grown sturdily since that date. (2) The manufacturing momentum, measured in terms of the percentage of manufacturing wage earners to total population, has been between 13 per cent and 15 per cent since 1870 (Table 3). Strong support for this optimistic fortune-telling concerning Manufacturing Evansville's future is presented in Chapter V, in terms of her high percentage of favorable trade patterns of individual plants.

TABLE 3
MANUFACTURAL MOMENTUM

Population ^a of Evansville	Per. Cent ^b	Year	Manu- factural ^c Momentum
100	...	1819	..
1,228	...	1837	..
2,121	...	1840	..
3,235	53	1850	..
.....	...	1859	8
11,484	255	1860	..
.....	...	1869	13
21,830	90	1870	..
.....	...	1879	13
29,280	34	1880	..
.....	...	1889	13
50,756	73	1890	..
.....	...	1899	12
59,007	16	1900	..
.....	...	1909	13
69,647	18	1910	..
.....	...	1919	15
85,264	22	1920	..
.....	...	1929	15
102,249	38	1930	..

^aCalculations are based upon reports of the Bureau of the Census, and Charles E. Robert, Evansville, Her Commerce and Manufactures (Evansville, 1874), pp. 47, 51.

^bIncrease over previous decade.

^cPercentage ratio of manufacturing wage earners to total population.

3. Manufactural freight rate level.--In order to test assumed relationship between Manufactural Evansville's freight rate level (stratum) and distance in her manufactural trade, a classification of freight Groups was set up (Table 4). The five Groups are discussed in Chapter V. Little if any such relationship was found thereby; but the manufactural freight rate level is a descriptive index of her status, from the point of view of her trade, in effect a description of her manufactural stratum.

TABLE 4
FREIGHT GROUPS^a

Group I.	85-100%
Group II.	70- 85%
Group III.	50- 70%
Group IV.	27- 50%
Group V.	10- 27%

^aAn original classification, 1934, based upon percentages of First Class freight.

The freight Groups were devised in order to ease the problem of handling upwards of two hundred major commodities, scattered in varying quantities among two hundred factories, in the maze of multiform freight rates, in such manner that each commodity could be placed in one of the five Groups and there weighted according to estimated quantity, and thus be treated as comparable units. The effectiveness of the index grows out of the fact that freight rates tend to reflect the nature of the commodity (value, density, perishability, etc.), that is to say, the relative degree of "refinement" or "economic texture" of the commodities in terms of the levels of the rates--although other factors also enter into the classification of freight rates. Thus, in as far as the procedure and calculations were valid,¹ the following statements can be made about the status of Manufactural Evansville as of the early

¹The mean of freight Group IV is about 65 per cent of the mean of Group III. The value of Manufactural Evansville's supplies (coal included) is about 55 per cent of the value of her products. Now, fuel and purchased electric energy were omitted in obtaining the freight rate level for materials moving to her; if coal and purchased electric energy were added to the materials, the freight rate level of supplies moving to her would be lowered, and the two

nineteen-thirties: (1) Materials (excluding coal) moving to her bore freight rate charges which, in composite, were approximately from 27 per cent to 50 per cent of railroad First Class freight rates--they moved in freight Group IV. (2) Likewise products moving from her bore charges approximately from 50 per cent to 70 per cent--they moved at a higher level, namely, in freight Group III. (3) Since railroad freight rates tend to reflect the relative degree of "coarseness and fineness" of the commodity, the preceding two statements give a reconnaissance concept of her status in terms of the stratum of her materials, and of the (higher) stratum of her products, i.e., her general position on the freight rate scale, indicating as it were the economic texture of the stuffs she received, worked, shipped. It might be likened to the "medium" in which a painter works. If Manufactural Evansville had engaged wholly in the cutting and polishing of car-loads of diamonds, she would have been described as having a very high freight rate index. But in fact, it was a bit below medium, on the freight rate scale.¹

4. Number and size of plants.--Measurement of manufactural centers (not individual establishments), such as Manufactural Evansville, in terms of number and size of plants reveal much. It is one of the most useful keys in manufactural studies especially when the item, size of plants, is handled in terms of numbers of manufactural wage earners, excluding officials, office and sales forces. The usefulness is enhanced when the validity of the role of the key has been checked by other means. Performance in terms of quantity of products is mercurial; in terms of dollar volume, even more so. The use of the cited key simulates the use of the moving average.

The two items, number and size of plants, reflect fairly reliably the performance of the manufactural center in a number of aspects, especially in production and trade. Exceptions in the

percentages would be more nearly equal. The gross agreement of the two percentages is evidence favorable to the validity.

¹To obtain her rating compared to other centers would require a large amount of primary data and statistical work. The percentage ratio cited in the preceding footnote (the item, cost of materials, fuel and purchased electric energy, and containers for products, versus the item, value of products) provides a useful substitute requiring far less work.

case of Evansville are not great. Among exceptions in general are factories in which the role of the machine overshadows greatly the role of the manufactural wage earner, e.g., machine-rolled cigarettes, machine-stamped parts. Another exception is the factory in which the value added in the process of manufacturing is very low--the value of the product does not exceed greatly the value of the materials, e.g., the commercial processing of grains and seeds.

The item, number of plants, tends to emphasize the role of the smaller plants, whereas the item, number of manufactural wage earners, tends to highlight the role of the larger plants. The truth lies between them and has advantages, but it is abstract and thus suffers in loss of realism--if such loss indeed be significant.

In the early nineteen-thirties the smaller factories of Manufactural Evansville constituted the majority of the firms, but the larger plants employed a majority of the wage earners (Table 54, Appendix I). In large measure, the smaller factories sold locally, the larger ones distantly. Accordingly the smaller ones hugged the inner parts of the city; also, the distant trade loomed large in terms of manufactural wage earners, but smaller in terms of number of plants. In large measure, the smaller plants were owned locally, the larger ones by extra-Evansville interests. These examples have been cited in an introductory manner to describe important features and to forecast treatment of others.

Changes and Trends

A chapter dealing with status and features would be scarcely complete without some attention to changes and trends.

1. Aggregate changes and trends.--Changes and trends in Manufactural Evansville as a whole are herein summarized in gross detail as follows (1859 to 1933, based on 1914):

a) The composite trend was generally upward steadily until 1914, after which there were violent fluctuations, net upward, incidental to such factors as manufactural evolution, Civil War, World War I, Great Boom I, Great Depression I (Table 5).

b) The number of manufactural establishments, according to reports of the Bureau of the Census, rose from 30 per cent of those

TABLE 5^aWAGE EARNERS AND PRODUCTS^b

Date	Raw Figures and Their Percentage of Those of 1914							
	Firms		Wage Earners		Production		Value Added by Manufacture	
	Num- ber	Per Cent	Num- ber ^c	Per Cent	Num- ber ^d	Per Cent	Num- ber ^e	Per Cent
1814	2	...	...	...	...	...	...	...
1837	11 ^e	...	...	...	1.1	3	...	...
1839	15 ^e	...	1	1	...	...	...	...
1857	...	...	...	...	1.6	5	...	...
1859	90	30	9	9	3.0	10	0.7	6
1869	281	95	28	27	5	16	2.0	17
1879	313	105	37	36	8	26	3	25
1889	482	163	74	72	13	42	5	42
1899	705	237	73	71	14	45	6	50
1904	268	90	78	76	18	58	7	58
1909	292	98	88	85	22	71	9	75
1914	297	100	103	100	31	100	12	100
1919	299	101	125	121	70	222	28	233
1923	223	75	132	128	66	213	27	225
1925	219	74	126	122	67	213	31	258
1927	212	71	129	125	86	278	40	333
1929	212	71	140	136	91	293	42	350
1931	180	61	102	99	59	190	31	258
1933	152	51	97	94	41	132	21	175

^aThe data are based chiefly upon reports of the United States Bureau of the Census.

^bEvolution of Manufactural Evansville in terms of number of establishments and wage earners, gross value of products, and value added in the process of manufacturing.

^cHundreds of wage earners.

^dMillions of dollars

^eThe total number was larger, but unknown. The statistics reveal a steady growth until 1914; thereafter came violent fluctuations, especially in values, related in part to World War I, Great Boom I, Great Depression I. The present century has witnessed a decrease in number of establishments and an increase in size. The first two factories to serve Evansville were a flour-mill and a saw mill.

of 1914 in 1859, to 237 per cent in 1899 (reportedly 705 firms), dropped to 51 per cent in 1933 (depression). The close of the century marked a culmination of a status of numerous, small firms. (The figures for 1899 probably include types of firms excluded in reports for some of the other dates.) The new century witnessed an evolution toward fewer, larger, firms.

c) The number of manufactural wage earners increased from nine per cent of those of 1914 in 1859, to 136 per cent in 1929 (about 14,000), and in 1933 dropped to 94 per cent (9,700).

d) The gross production rose from five per cent in 1859, to 293 per cent in 1929 (91 million dollars), and dropped to 132 per cent in 1933 (41 million).

e) The value added by manufacturing rose from six per cent of that of 1914 in 1859, to 350 per cent in 1929 (about 42 million dollars), and dropped to 175 per cent in 1933. The fact that the rate of increase in the item, value added by manufacturing, exceeds that of the item, gross production, suggests that there has been an increase in the manufacturing level in the class scale, an inference substantiated in detailed studies.

f) The performance per average manufactural establishment (Table 6) rose from 29 per cent of that of 1914 (35 wage earners), in 1859, to 183 per cent in 1933 (64 wage earners). The gross production per average plant rose from 17 per cent in 1859 (18 thousand dollars), to 412 per cent in 1929 (429 thousand dollars), and then declined to 259 per cent (269 thousand dollars). The value added by the process of manufacturing rose from 20 per cent in 1859 (eight thousand dollars), to 495 per cent (198 thousand dollars) in 1929, and then declined to 345 per cent in 1933 (138 thousand dollars).

2. Changes and trends by Groups.--Changes and trends in the nine manufactural Groups present differing aspects according to the point of view used.

Gross value of products.--Herein we see the advance and recessions in terms of the gross value of the products, by Groups, as follows (Table 55, Appendix I):

a) The wood Group ranked first between 1879 and 1919, but by the early thirties had dropped to second place. In many ways wood has been the basic manufactural industry of Evansville.

TABLE 6
AVERAGE ESTABLISHMENT^a

Date	Percentages Based on the Year 1914 ^b					
	Wage Earners		Gross Production		Value Added by Manufacture	
	Number	Per Cent	\$1,000	Per Cent	\$1,000	Per Cent
1859	10	29	18	17	8	20
1869	10	29	18	17	7	18
1879	12	34	26	25	10	25
1889	15	43	27	26	10	25
1899	10	29	20	19	9	23
1904	21	60	67	64	26	65
1909	30	86	77	74	31	78
1914	35	100	104	100	40	100
1919	42	120	237	228	94	255
1923	59	168	296	284	121	302
1925	58	166	306	294	141	352
1927	60	171	406	390	189	472
1929	61	174	429	412	198	495
1931	57	163	328	315	172	430
1933	64	183	269	259	138	345

^aCalculated from Table 5.

^bEvolution in the performance per average establishment of Manufactural Evansville: number of manufactural wage earners; gross production; value added in process of manufacturing.

In general the performance per average factory increased steadily until World War I, and since then has fluctuated widely. The exceptions for 1899 are related to the fact that for that year the survey included a wider range of firms than for other dates, admitting smaller firms. The striking increases in the item, value added by manufacture, after World War I reflect an increase in the size of the average plant, in the use of technology in production, decrease in the value of money, etc.

b) The manufactures of food led in 1860, ranked high as a Group until 1919, when it again seized first place.

c) The metals-alloys Group led in 1867, and since then has been struggling for first place, having tied for that ranking in 1919. In 1933 it seemed headed for leadership.

d) Despite its small number of categories, the tobacco Group has held a strong position in Manufactural Evansville since the eighteen-fifties, has ranked fourth since 1899. These four Groups

constitute the major manufactural lines of Evansville.

e) The leather-clothing-textile Group, ranking first in 1869, has fluctuated at or near the head of the minor Groups. Leather has declined; textiles have plodded; clothing has fluctuated opportunely, widely, with a large spurt in the early 'thirties.

f) The coal-stone-clay-sand Group has steadily held a position about fifth or sixth. Electricity, included in this subdivision, has tended to strengthen it in recent decades.

g) The paper-printing-publishing Group and the chemical Group have persisted, though low in rank.

Number of wage earners.--Herein we see the performance in terms of numbers of wage earners, by Groups, as follows (Table in Appendix I).

a) Wood has held about the same positions as on the basis of gross value of products, largely because machinery has played neither an excessive nor a minor role.

b) Metals-alloys have maintained a position somewhat stronger than in terms of dollar volume, in part because of the role of the workers; the Group attained leadership in 1932, largely owing to vigor, and abolition of "Pittsburgh plus" freight rates.

c) The position of the food Group is lower than that viewed by dollar volume, largely owing to the high role of machinery in such industries as flour-milling and meat-packing.

d) Tobacco has ranked considerably stronger, owing to the fact that until recently machinery played a relatively minor role in the manufacture of cigars in Evansville.

e) The ranking of the other Groups differs little from that on the basis of gross value

Composite basis.--Herein we see the performance of the Groups on the composite bases of wage-earners and gross value combined, as of equal weight, as follows (Table in Appendix I):

a) The wood Group maintains its high ranking, yielding first place in 1932.

b) Metals-alloys run a close second, taking first place in 1932. The Group became co-basic with wood, and later led:

c) Food ranks almost consistently in third place.

d) Tobacco rises from seventh place to fourth.

e) Textiles-clothing-leather fluctuates widely, rounding the 'thirties in fifth place.

- f) Coal-stone-clay-sand fluctuates less widely, landing eventually in sixth place.
- g) The others persist, ranking low.

Section 2. Composite Manufactural Evansville

It is alleged that Manufactural Evansville:

Germinated in local needs of village Evansville in the eighteen-twenties.

Seedlinged, saplinged, treelinged under the canopy of Commercial Evansville, and the windbreak of absence of large, close-neighbor cities. It treed during World War I.

Habituated in local wild-life, farm products, timber and coal; watered in Evansville Ohio River gateway and its freight rate advantages; aerated in river, rail, and highway conveyance; photosynthesized in the sunlight of manufactural trade; and flowered into diverse fruits.

Tap-rooted in the Evansville Tri-State Area; root-fasted deeply in the South; sank a secondary root, now dominant, in the North; rootages widely, firmly in the Midwest.

Root-ran a complexly orderly mosaic in the land use patterns of terrace-sited Evansville; branched an equally intricately orderly manufactural trade pattern within the trade currents and flow of Eastern United States.

Has been fertilized by the English pioneer immigrants of means, by Commercial Evansville profits and experience, by advertisement and inventions, also by recent Northern and Northeastern financial elements, and by early transportational advantages promoted through local investments; fibred by German immigrant diligence, frugality and manual training; cultivated by managerial talent, local organizations, and a few leading urban spirits; irrigated by salesmen; pruned by adversity, manufactural evolution, planning, and by Evansville land use patterns, especially conveyance, residential and business--overall somehow self-impelled by initiative, but spurred by changes in its setting.

Has been conditioned by its existence in the Wabash Valley minor corridor where it intersects the Ohio River in the midst of Eastern United States, by its pocketed setting, by its marginal location in the American Manufacturing Belt, and by its situation between North and South.

Has been harassed by recedence of some of its sustenance, by recent waning of its gateway freight rate advantages, by competition pests, depressional droughts, speculative frosts; infected a bit by rankness in the form of quantity-productionism, by the softwood of provincial sensitivity, and the worm of complacency; overly-forced recently by surplus rain accompanying World War I, Great Boom I; a bit blasted and stunted more recently by industrial storms accompanying Great Depression I; oft renewed

by selection, grafting, mutation, and technology.

Though swayed by the wind of events, is not senescent, bids fair to persist long for the reasons, among others, that its design is favorable, the structural heart-wood and trade-cambium are sound, and Manufactural Evansville has become in a sense a century-long modus operandi in the city of Evansville.

CHAPTER II

SETTING

In Chapter I it is forecast that the setting¹ of Manufactural Evansville has been of major importance to manufacturing in that city. Hence Chapter II is devoted to an examination of the setting, with an eye for discernible order. The setting will be treated radially outward: First, locally; then regionally; last, nationally. The site of Evansville has been the most nearly stable aspect of the setting of Manufactural Evansville; the situation, an in-between; whereas the remainder of the setting has introduced many variables.

It is discernible that the setting acted as a spur, the while there was self-impellment by the Evansville men (which impellment will not be analyzed). The conception is that of a spur for serious analysis--a multiform, variant, partly-understood challenge, appearing to each of the men somewhat fortuitously, pregnant with opportunity and risk.

Section 1. Selected Local Aspects

In Evansville's Land Use Pattern

Important element.--In 1933 Manufactural Evansville's land use pattern was an important element of that of Evansville, and lay almost wholly within it (Fig. 1), although about six per cent of the total number of factory grounds (about 13 per cent by acreage) lay beyond the city limits. True, some of the factories, once peripheral, largely had become engulfed by the areal growth of Evansville (Fig. 17), with multiform results, herein not detailed. The land use pattern was about one-twelfth of the city total, about seven times that of the Business District--

¹Consideration of setting in various forms, has long been used by geographers. For example, it has been used with telling effect by Barrows, Brunhes, Colby, Dryer, Jefferson, and Mackinder.

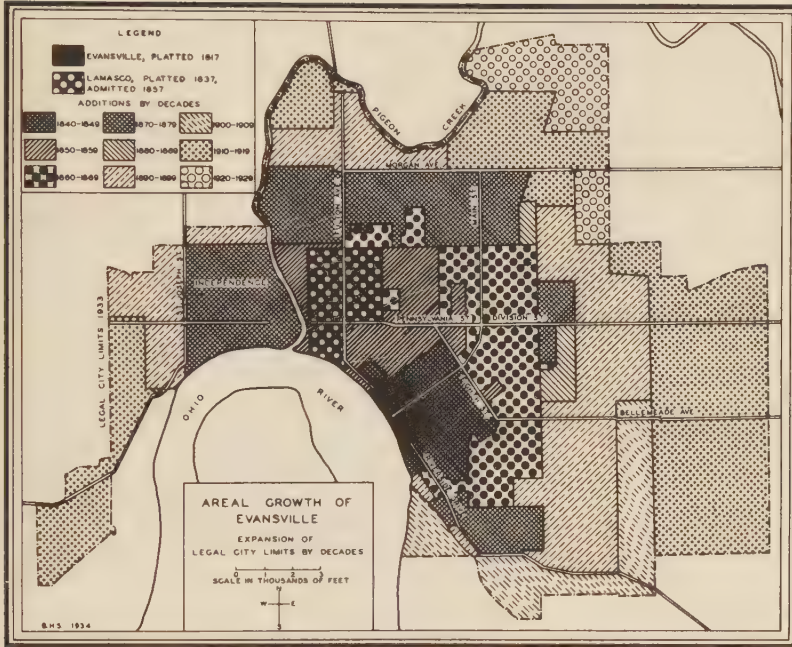


Fig. 17.--Areal growth of Evansville. Attention is directed to the Evansville and Lamasco kernels about which the city has developed. (Based on data from Evansville City Plan Commission, civic records and other historical data.)

in many ways a nearly balanced pair, rival-confederates (Fig. 1, F-7). Her functioning interlaced intricately with the rest of the city's, often coöperative, sometimes individualistic.

Distributional bearings.--There were potent distributional interconnections between the factories and the land use pattern of the city: (1) The basic connections were with the conveyance ways--primarily the railways, secondarily the waterway routes, and subordinately the car, bus, and truck lines; also an electric freight railroad. These service lines climaxed in the various terminals, freight stations, team tracks, and railroad spurs to the factory grounds (Figs. 2, 3, and 15). (2) Some kinds of factories prized proximity to the inner parts of the city, others favored outer localities (details reserved for Chapter IV). (3) There were restricted areas, especially the southeastern quadrant of the city, which was almost void of factories. Moreover, there were zone regulations, especially those of the City Plan Commission, in the form of a land use district map (Fig. 18). (5) Uninterrupted localities undesirable for residence and business, such as some of the land bordering Pigeon Creek, had played an important role in Manufactural Evansville, and in 1933 offered some opportunities for expansion. (6) Coal mines within the limits of the city were favorable to certain adjacent manufactural categories, e.g., ceramics (Fig. 2, F-5). (7) Relative land values as reflected by the residential pattern had influenced the distribution of specific factories. (8) The pattern of the city water mains and sewage lines served well the factories, in general.

Other bearings.--Of other interconnections between Manufactural Evansville and the city's land use pattern, two are cited. Evansville's pattern as of 1933 was such that room for manufactural expansion with good, extant railroad service was rather limited. Extensive expansion with such railroad service would, with some exception, involve one or more of the following expediciencies: purchase of valuable developed land; development of low land; trek to peri-urban sites, mainly on the bluffs about the city or on the upland beyond. The residential districts were rated, by and large, medium or less, in part due to their proximity (Fig. 1).

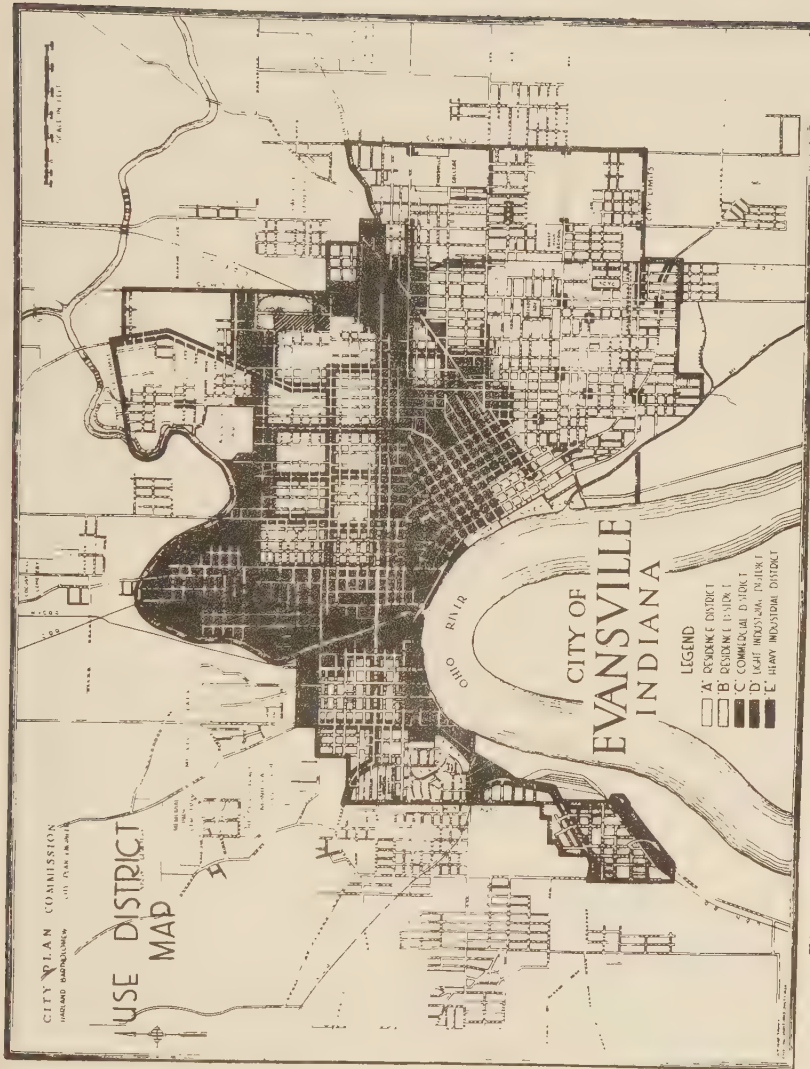


Fig. 18.--Land use district map of Evansville 1924. Zone ordinances regulate the use of the land in the various districts. For description of Fig. 18, see Appendix II.

In the City Traffic

In the early nineteen-thirties the local traffic to, from, and among Evansville factories was, in general, excellent, especially that rendered by railways, which handled most of such freight by an intra-city switching service.

Favorable aspects.--Such local traffic service was rendered the factories by means of shuttling facilities--railway and others. Outstanding among the former were the Joint Track Railroad and the Belt Railroad (Figs. 2 and 15). When it was constructed, the Joint Track was, in effect, an outer belt line which connected Evansville's earliest two railroads (and subsequently the others); but it became entangled in the areal growth of the city. Then the Belt Railroad was built as an outer belt line, which in turn was being engulfed; therefore Evansville and Manufactural Evansville mutually hoped and planned for a third outer belt line--with considered expectancy. Among the second type of shuttling facilities were automobile trucks, the importance of which was mounting. The relative quantity of freight service rendered to each factory by its leading conveyance-servants, as determined through estimates by factory and conveyance officials, is depicted in Figures 19 and 20.

The freight which was consigned to the factories moved to the plants, in general, within twenty-four hours after arrival at Evansville terminals. In terms of quantity of service, the estimated rankings of the receiving servants in incoming freight were as follows:

1. Railroad freight depots
2. Factory railroad sidings
3. Truck terminals
4. Express depots
5. Mead Johnson Terminal (river-rail-truck)
6. From other factories in Evansville
7. From local dealers
8. Post Office
9. Team tracks, street railway freight depots, wharf boat, other river terminals, local elevators and local storage establishments

The freight which was consigned from the factories reached its local destination or left the city, in general, within twenty-four hours after it left the factory. In terms of quantity of service, the estimated rankings of the receiving servants in outgoing freight were as follows:

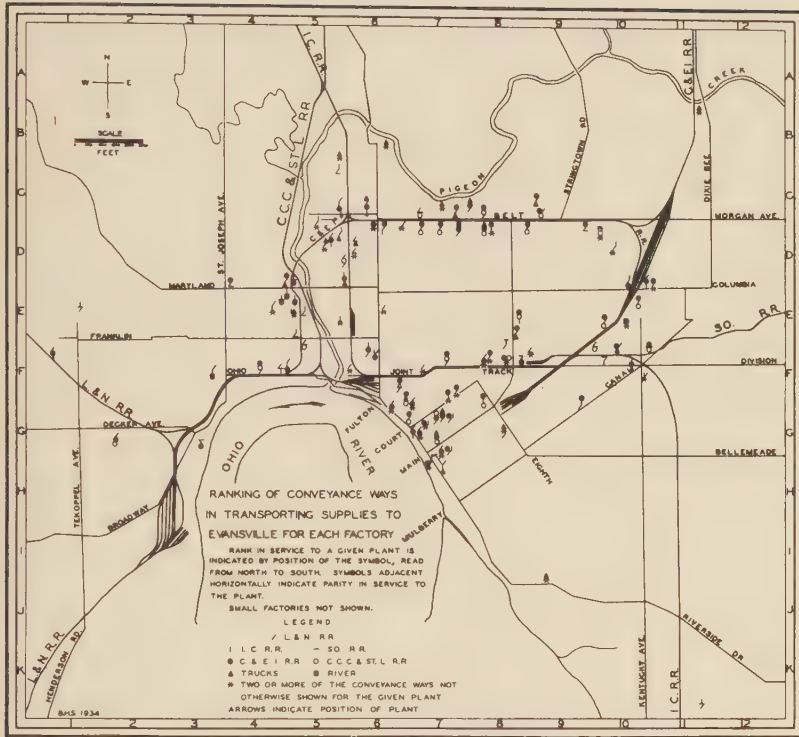


Fig. 19.--Incoming factory freight traffic.

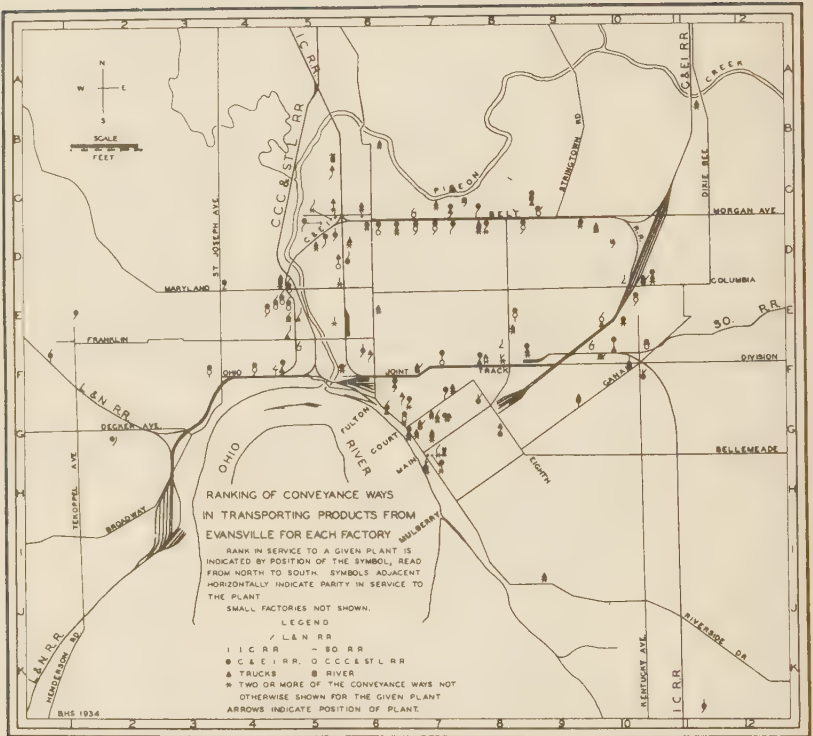


Fig. 20.--Outgoing factory freight traffic.

1. Railroad freight depots; truck terminals (tied)
2. Factory railroad sidings
3. Express depots
4. Mead Johnson Terminal
5. Post Office
6. To other factories
7. To local dealers
8. Wharf boats
9. Local elevators and other storage establishments; other river terminals; team tracks, street railway freight depots

Unfavorable aspects.--The local traffic service rendered the factories was handicapped by imperfections in the traffic service rendered to the entire city, the quality of which was good but not excellent. The chief effect of the imperfections was retardation in the flow of traffic. Not only were there numerous railroad crossings in the street pattern, but in addition railroad tracks on parts of some of the streets. A paucity of bridges spanning Pigeon Creek was contributory to the existence of hundreds of "dead ends" of streets; contributory also were interruptions of streets by a number of large tracts of land, such as parks, state property, educational grounds, and the Sweezer Pond depression area, a remnant of the flood-plain of prehistoric Pigeon Creek (Figs. 1 and 4). Non-conformity in the trend of streets in the older portion of the city in comparison with the trends in the newer portions emphasized a paucity of radial streets. Routes connecting the southern wings of the city embracing the hairpin bend of the Ohio River were necessarily circuitous. Finally, there was retardation in the flow of traffic because of decentralization, growing out of the fact that Evansville is an amalgamation of three minor centers: Evansville, Lamasco, and Independence, known also as West Side or Franklin (Fig. 17).

In Evansville's Site

Almost all of the manufactural grounds, 1820-1933, were located upon an Ohio River terrace (Fig. 5) which is the site of most of Evansville, all except for a small amount of associated flood-plain and valley bluffs. The terrace is a smooth quasi-horizontal plain, chiefly between 380 feet and 400 feet in altitude. It is fronted by a flood-plain (between 340 and 370 feet in altitude), and bordered by the Ohio River, as well as embraced

by its bluffs (the edge of a background upland in early maturity, about 600 feet in altitude). Thus the terrace is largely ensconced except for an easterly extension of the terrace beyond Evansville; but it is not, in effect, sharply hemmed in. Finally, the terrace is trenched by the valley of Pigeon Creek.

Favorable terrace site.--The terrace is largely of fluvio-glacial material resting upon, and bordering, bed-rock, some of which bears coal and shale, both manufacturally pertinent, and which fluvio-glacial material filters and stores water for deep wells. The terrace is rarely subject to flood except along Pigeon Creek and parts of the fringe bordering the Ohio River (Fig. 2, flood line)--however, most of the terrace was submerged during the unprecedented flood of 1937, since which time extensive flood-control improvements have been constructed. It is well drained because of its elevation above the flood-plain, which permits adequate pitch in sewage lines; moreover, it bears drainage improvements. In gross it is a terrace site favorable for buildings and grounds.

Potent waterways.--The waterways of the site have been a local challenge--both auspicious and irascible spurs. The Ohio River afforded a splendid water route, but the river discouraged bridgmen at Evansville because of its fluctuating levels (Flood in 1913 was held to be devastating, but it was much higher in 1884 and in 1937) and its wide flood-plain associated with the river's prognathic bend. Accordingly the Ohio River railroad and highway bridges serving Evansville were located at Henderson, Kentucky, about ten miles downstream of Evansville, where the distance spanning the river between suitable high land for bridgeheads is less pronounced than at Evansville (Figs. 4, 5, 21 and 22). Land conveyance ways between Evansville and the Indiana bridgehead opposite Henderson approached Evansville in 1933 on causeways (1) over lowland adjacent to Evansville, and (2) via a narrow terrace fringing the foot of the Ohio River valley bluffs. Parts of the manufactural land use pattern at Evansville were distributed in adjustment to those somewhat devious conveyance ways affording Evansville, in effect, a bridgmen of the Ohio River. The Ohio River makes its key contact with Evansville at the foot of the city (Fig. 23): there the river borders the terrace on the outer side of the hairpin curve; there the river is deep and moderately swift,

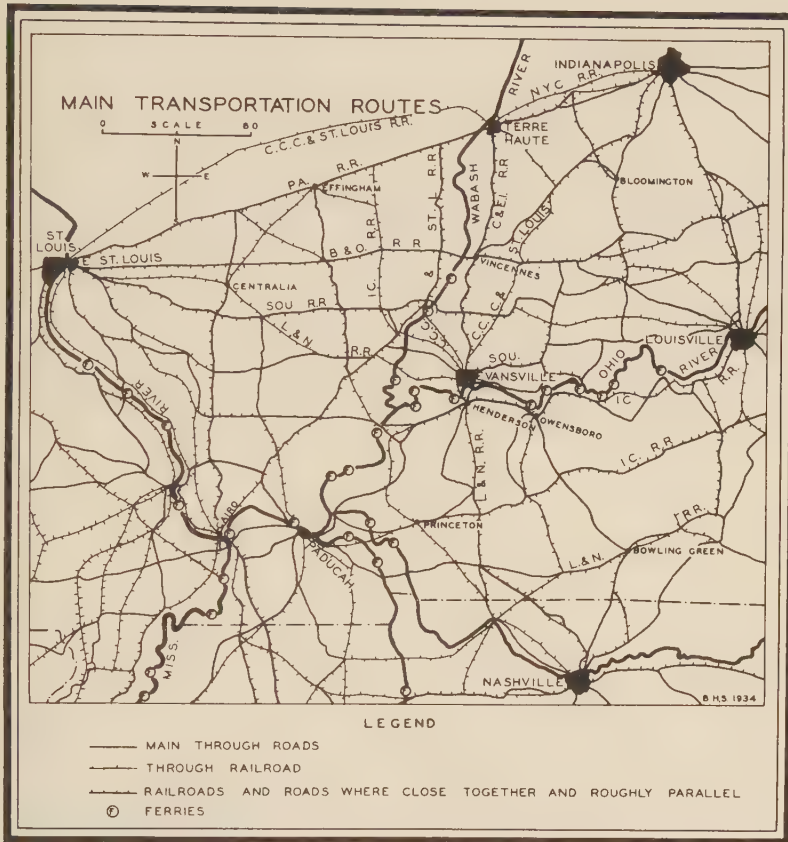


Fig. 21.--Main transportation routes



Fig. 22.--Ohio River highway bridge. It spans the river near Henderson, Kentucky. For description see Appendix II.



Fig. 23.--Key sites in the founding of Evansville. They are the site of the levee (normal river stage), and the mouth of Pigeon Creek. For description see Appendix II.

and also is largely free from ice because of the inflow of water from the swift, southerly Green River, which empties into the Ohio a few miles upstream; there grew infant Evansville and infant Manufactural Evansville. The Ohio River has been the main source of water for Evansville, whose supply of water fortunately has remained ample. In the early nineteen-thirties the city used about 40,000,000 cubic feet daily, more than half of it for manufacturing purposes.¹

Nearly a mile downstream from the birthplace of Evansville, Pigeon Creek joins the Ohio River. Its lower reaches and mouth afforded in early days a conveyance haven for small craft and a ferry, and conveniences for manufacturing (Fig. 24). That creek also provided running water for disposal of waste for such factories as early slaughtering factories and tanneries. But the groove which is the incised valley of Pigeon Creek divided the terrace (Fig. 5) and thereby made unity more difficult, an expensive matter. It even mothered decentralization by providing a suitable locality for the once separate town of Independence, the business district of which is extant, in the city of Evansville. Proximity to the lower reaches of the creek likewise mothered Lamasco, the business district of which still flourishes in the Crescent City.

Favorable climate.--The climate of Evansville is favorable for manufacturing throughout the year. Mildness of its winters in comparison with most other woodworking centers north of the Ohio River constitutes a relative advantage in yard-handling of timber and lumber, as well as some other items.

In Local History

Both Evansville and Manufactural Evansville, which is an important component, have experienced reciprocity during their growth, normally harmonious.

Parallel growth.--Their growth has been mainly parallel. Manufactural Evansville and the city fluctuated within small amplitudes, 1820-40, net forward, in line with advances and recessions

¹The use of water is represented in the land use pattern by intakes (Fig. 2, J-9) except in case of the new power plant, which is served by a channel constructed in the bed of the river. The use is also represented in the manufactural landscape by factory-yard minutia, and by water towers (Fig. 3).

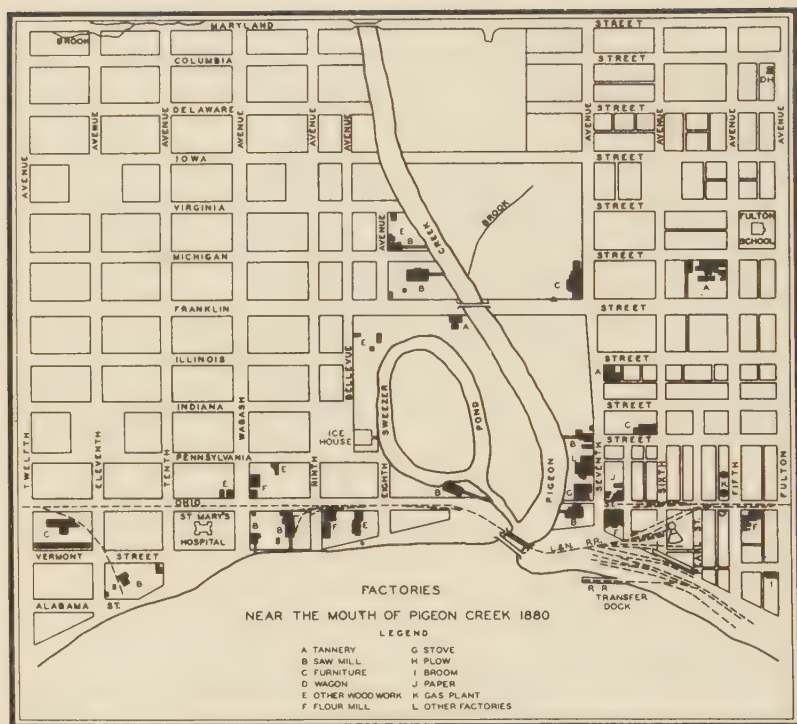


Fig. 24.--Factories near the mouth of Pigeon Creek 1880. Logs were floated down the creek, and into the creek from the Ohio River. Sweetzer Pond was used as a storage pool for logs. (Based on data from city directories; D. J. Lake and Co., An Atlas of Vanderburg County 1880; and other sources.)

in economic and political circumstances (Appendix I). They struck their stride in the eighteen-forties as river-trade and immigration boomed, and canal and railroad transportation loomed. Then both developed steadily until World War I, taking a modest spurt as a result of the Civil War (recession followed by greater advance). Since 1914 they have fluctuated within greater amplitudes, net forward, in line with World War I, Great Boom I, and Great Depression I (also World War II). For decades Evansville keynoted in wholesaling, partly entrepot; only gradually did manufacturing overtake and surpass wholesaling.

Helpful aspects.--The city's growth aided Manufactural Evansville in a number of ways. The city helped to realize potent railroad opportunities by large promotional investments--the purchase of railroad bonds to the extent of about a million dollars, by individuals, the city and the county. Wholesalers provided manufacturers with much capital, experienced executives and proprietors. Wholesaling Evansville made available to Manufactural Evansville a large variety of materials, was per se an important market, and developed many trade connections. Accordingly Manufactural Evansville, in addition to bona fide manufacturing, engaged substantially in commercial processing. The city developed a spirit of cautious, friendly aggressiveness, accentuated later by the advent of Northern and Northeastern captains of industry.

Manufactural Evansville profited by five strains of newcomers to the city. Southern pioneer settlers came, whose kinship with the South facilitated trade therewith. A bit later came Eastern early post-pioneer settlers, via the Ohio River and the Great Lakes, who contributed funds and aggressiveness. Near the beginning, came English immigrants of means, who farmed and vilaged north of Evansville and later sent descendants to that city, who contributed considerable capital and leadership.¹ Presently

¹J. E. Iglehart, History of Vanderburgh County (Dayton, 1923), p. 47.

Early in the eighteen-hundreds (about 1817) English of means, supplemented by Scotch and Irish, settled on farms north of Pigeon Creek along the state road leading from Evansville to Princeton. They came chiefly from Chatteris, England, assisted by an immigration organization, and spurred by economic discontent induced by the Napoleonic Wars. Saundersville (Stringtown, Mechanicsville) was the settlement village.

Many of the settlers bought farms as large as one thousand

German immigrant settlers began to arrive in large numbers. Since the middle of the nineteenth century the German element in Manufactural Evansville has been prominent, in labor, management, capital.¹ Probably a majority of the manufacturers in the history of Evansville down to the early nineteen-thirties were of German birth or lineage.² Many of them put to use, in Evansville, aptitudes and training acquired or developed in Germany, especially in wood-working, butchering, leather-working, cigars, and machinery. In 1930 three-fifths of Evansville's foreign born population were German, and of German extraction were three-fourths of her native white population of foreign or mixed parentage. The fifth strain of newcomers to Evansville was negro (about six per cent of the city). By the early nineteen-thirties, thousands of them labored in that city, many owning their own homes.

Among other helpful aspects, one cannot overlook the general item that the population of the city has been a source of manufactural labor, especially in view of the fact that in the nineteen-thirties, and earlier, the manufactural wage in that city was higher than the average wage therein.

Less tangible aspects.--Among the important imponderables in the local history, viewed from the standpoint of manufacturing, have been traits of the city and manufacturing populations. In 1930 the population of the city and its manufacturing population. In born. The population appeared to be, in general, (1) conservative, (2) individualistic, (3) neighborly, (4) frugal and financially sound, (5) somewhat provincial (which trait is vanishing), and,

acres. The settlers prospered; developed educationally; contributed considerable leadership. Descendants in Evansville became there a president of the Evansville and Crawfordsville Railroad, a banker, a manufacturer, a political leader, etc.

¹F. M. Gilbert, History of the City of Evansville and Vanderburg County, Indiana (Chicago: Pioneer Publishing Company, 1910), I, 52.

Gilbert estimates that 85 per cent of the immigrants into Evansville were German. Biographies of 166 Evansville Manufacturers prominent in the evolution of Manufactural Evansville disclose that about 63 per cent were of German birth or extraction.

²Bureau of the Census, Tenth Census of the United States: 1880--Manufactures of the United States 1880 (Washington: U.S. Government Printing Office, 1883), pp. xxxvi-111.

In 1880 more than 20 per cent of the persons engaged in Evansville in manufacturing, mechanical, and mining industries were German born.

finally, (6) changing its basic elements in response to an incipient inflow, from beyond Evansville, of capital, management, labor. With exception, Evansville was a city of small homes, with home-ownership ranking approximately in line with that of Northern cities.¹ The average income and expenditure per industrial family was low in comparison with cities north of the Ohio River; but it was high in comparison with those south of that river. In 1933 the manufactural population resided chiefly in Evansville, "at home"; probably less than one thousand lived beyond the city. The residence was scattered throughout the city, but in general chiefly within walking distance of the factory. The quality of labor, in general, appeared to be commonly reliable; probably below the average of Northern cities in technological training, but highly capable of acquiring it; above the average of Southern cities in technological training.

Public and quasi-public organization.---In 1933 available to Manufactural Evansville were the services of municipal and commercial organizations of superior quality. The Evansville Manufactural Association was supported by the manufacturers. The Chamber of Commerce was active, e.g., in securing advantageous freight rates. The City Planning Commission was mature in time of service, e.g., in improving the conveyance pattern of Evansville.

In the Local Occupation Pattern

In the early 'thirties, manufacturing in some respects dominated the Evansville occupational structure, especially in numbers gainfully employed. It employed about 37 per cent of the total in 1929. In some other respects, manufacturing did not lead. The gross value of the manufactural products was less than the dollar volume of commercial trade (wholesale plus retail). Manufactural Evansville did not dominate in total "Business Evansville."

The average percentage of women among the manufactural employees of 1929 approximated the percentage of women among Evansville's total of gainfully employed---although some manufactural categories depended strongly upon female labor, as for example, the cigar, clothing, and textile industries (Appendix I).

¹Evansville Chamber of Commerce, Industrial Survey of Evansville, Indiana (Evansville, 1926), I, secs. 7-10.

Section 2. Selected Tri-State Aspects

Manufactural Evansville has counter-pointed Evansville in its role as the dominant urban, business, manufacturing, commercial center in the Evansville Tri-State Area (although there are smaller centers). For decades urban Evansville was the Paris of rural Tri-State; conversely, the Area was her rural foil by virtue of contrast and allegiance. The predominance of Evansville's sway is decreasing near the margin, with increase in penetration of the Area by Evansville's ring of rival cities; (each at least 120 miles distant from her). But improved conveyance ways and means (Fig. 21) are knitting the inner portion (retail market) catamorphically ever closer to the city. Thus gradually the retail market area is being enlarged and magnetized into the Evansville District: its city-rind, perhaps destined to become compactly complex, but texturally oriented. The outer portion of the Area, undergoing anamorphism under inward-out-ward-diverse stresses (exerted by Evansville, her rival cities and the smaller centers), may slowly subdivide into a multiple-unit, isomeric mosaic (in fancy suggesting a shaggy bark, with crumbings, corrugations, and knotty spots, representing inroads by Evansville's competitors)--all together a no-man's land surrounding the District. Thus the Evansville Tri-State Area, as an unified Area, may largely vanish in the distant future, except chiefly as a source of labor and supplies: coal, lumber, and agricultural products, etc., for Manufactural Evansville, and as a market for some of her products. If so, the Manufactural Component will largely cease to counterpart the city jewel (inscribed in its District ring in turn garlanded by a fainter wholesale fringe), but primarily will function asunder in the shadowy Tri-State Area. However, the city, in its setting, still presents striking individuality.

Extant Tri-State Gross Pattern

The boundaries of the Evansville Tri-State Area, a bit vague, extend from fifty to seventy miles (or more) distant from Evansville. Its name (Tri-State) is used locally in common parlance; it has been mapped¹ and its population has been carefully

¹Traffic Department, Evansville Chamber of Commerce, Map of Tri-State Area 55 Mile Radius of Evansville, Indiana (Evans-

estimated;¹ but its boundaries have not been wholly satisfactorily precisely delimited--probably this would be impossible, because the limits vary according to the bases employed. Approximate boundaries of the retail and wholesale districts of the Area, as of 1933, are presented in Figure 12. It is substantiated by maps of (1) the area which supplied most of the livestock received at the Evansville Union Stock Yards (Fig. 25); (2) the areas which supplied most of the milk and cream for Evansville (Fig. 26); and (3) the areal distribution of the out-of-town circulation of Evansville newspapers (Fig. 27). Since there was inter-city competition for the animals and dairy produce, and since out-of-town buyers use sales advertisement of daily papers, the three bases were pertinent. The research department of the local Chamber of Commerce was also consulted, and a questionnaire instituted among selected mercantile establishments. In round numbers is accepted a population of a half-million in the retail trade area, and a million in the wholesale trade area, as of 1945; with somewhat smaller totals for the areas as of 1933, about nine-tenths.

The Evansville Tri-State Area, comprising upwards of six thousand square miles,² is notably large for a city of the 100,000

ville, 1945).

Evansville Chamber of Commerce, Evansville, Indiana (Evansville, 1945), p. 19. This reference is to a map of "Evansville's Retail and Wholesale Trade Area." The retail area thus mapped is of eighteen counties about Evansville, and is based upon delineation by Batten, Barton, Durstine and Osborn used by Sales Management Magazine in its April 10, 1941, "Survey of Buying Power." The boundaries of the retail area are thus made up specifically of portions of the county boundary lines. The wholesale area thus mapped has generalized boundary lines, which are not county lines. A 55 mile radius from Evansville is the commonly used means of designating the retail trade area. The extent of the wholesale trade area is described as extending "from 75 miles to 150 miles in every direction."

¹Evansville Chamber of Commerce, A Brief Showing Factual Information on Evansville, Indiana (Evansville, 1944), pp. 8-9. The population of the area within 25 miles radius from the center of Evansville was therein estimated to be 223,672; of the area within 50 mile radius was estimated as being 577,307; of the area within 75 miles radius, 1,028,807. In these calculations, population of portions of marginal counties cut by the circumference line were excluded.

²The Tri-State Area is sometimes legitimately described as comprising about 15,000 square miles or more. The basis for such an estimate is usually the distance of some of its wholesale ship-

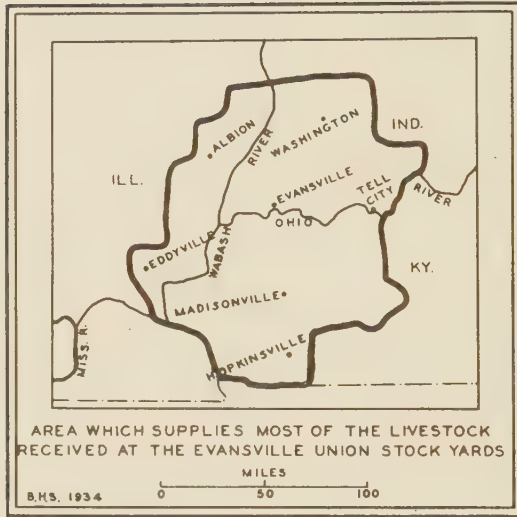


Fig. 25.--Areal source of live stock. (Based on data from the Evansville Union Stock Yards Company.)



Fig. 26.--Areal source of milk and cream.

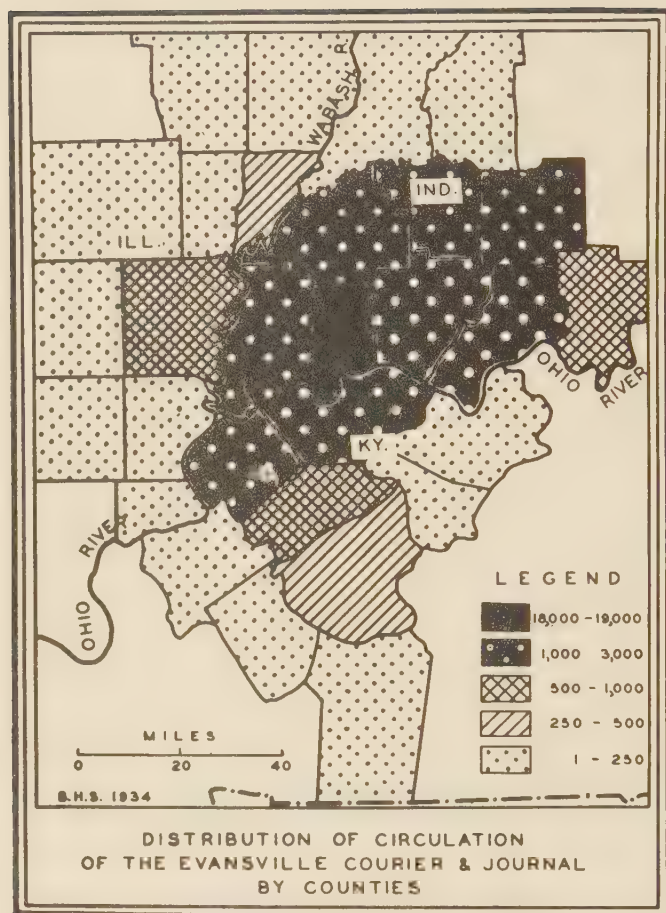


Fig. 27.--Areal destination of newspapers.
(Based on data provided by the company.)

class in the Midwest. The chief, specific factors which brought about absence of other cities of its size (or larger) within a radius of 120 miles have been Evansville's competitive power, and difficulties of conveyance in the Evansville Tri-State Area and its surrounding territory (whence arose the name, "The Pocket," which scarcely applies any more). There were no other centers in The Pocket with a combination of space, human factor, and time comparable to that of Evansville. The Pocket was hilly, being in various stages of maturity and early old age; moreover, portions were poorly drained, especially in the flood plains, also, numerous ferries were required to cross the maze of streams, in many places too deep to ford.

By 1933, local conveyance facilities of the Evansville Tri-State Area had become, in general, good although not excellent (Figs. 21 and 28, Table 7). At long last a highway bridgmont of the Ohio River (Fig. 22) had been effected (1932) and this, together with greatly improved roads plus autoing and trucking, served to knit the Area together (Fig. 29), thus increasing its importance to Manufactural Evansville and the city. For example, there was an associated sharp rise in the receipts of livestock and farm produce. Although steamboats were no longer registered at Evansville and official agencies were no longer listed, local river transportation service persisted (especially coal, railroad ties, sand and gravel). Extra-local steel barge line traffic was increasing; the Evansville calls were greatly facilitated by the Mead Johnson Terminal, river-rail-truck.

In the nineteen-thirties the Area, minus Evansville, served the Component (to use a brief designation for the term, Manufactural Evansville--a component of Evansville) mainly as a large pool of roughly hewn, individualistic, orderly labor, capable of considerable cooperation for the success of the whole; as a source of about six per cent of its materials, plus almost all of its coal and some of its gas; and as a destination of about two per

ments, especially groceries. In the nineteen-thirties coffee from New Orleans was commercially processed at Evansville and then wholesaled to distant cities; citrus juice was received at Evansville and there commercially processed (e.g., with respect to containers, labels, etc.) and later wholesaled; sugar was assembled at Evansville from New Orleans. However, Evansville does not dominate such distant centers and fields. These kinds of circumstances, underlie the use of the term, Evansville Tri-State Area, in this

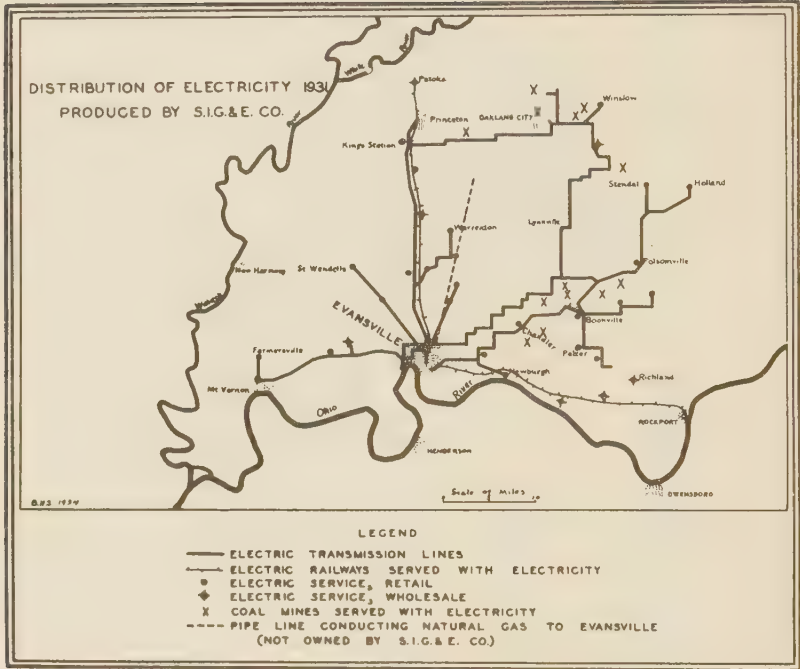


Fig. 28.--Sales pattern of electric power. (Based on data provided by the company.)

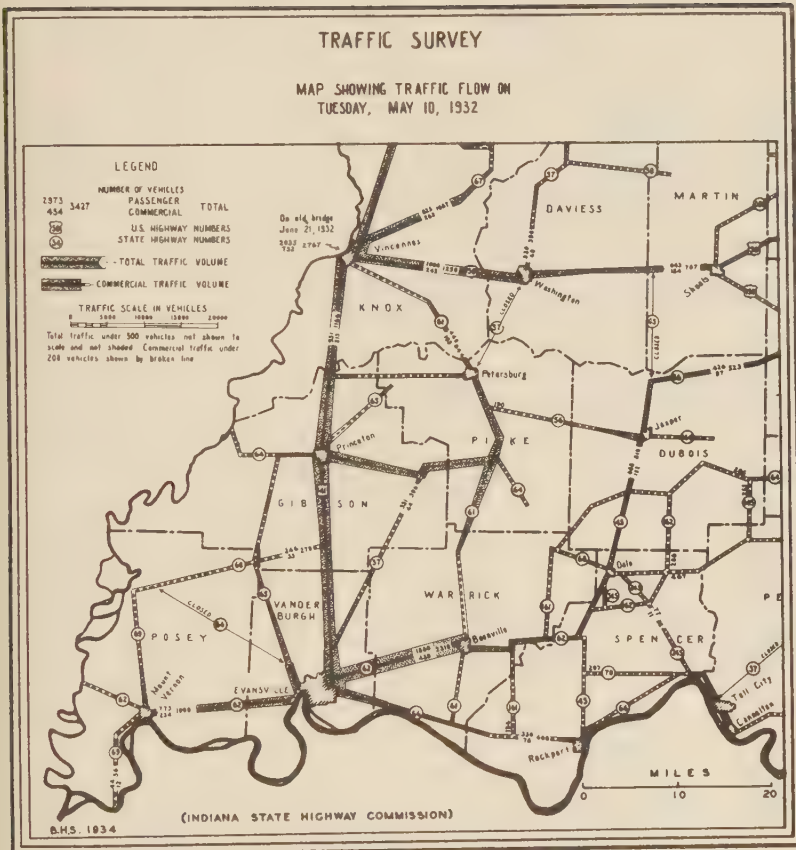


Fig. 29.--Flow of traffic 1932.

TABLE 7

PURCHASERS OF ELECTRIC POWER 1929^a

Consumer ^b	Per Cent of Total
1. Detailed break down (1929)	
Residential lighting.	33
Commercial lighting	27
Municipal lighting.	4
Food and dairy products; ice, coal, brick and tile. .	12
Automotive industries; steam shovel plant; iron and steel construction plants; foundries; machine shops	7
Electric and gas refrigerators; furniture factories; other woodworking plants.	7
Miscellaneous users of electric power	6
Other public utility companies.	4
2. General break down (1929)	
Distributed beyond city limits ^c	24
Consumed in Evansville.	76
Consumed by Evansville factories	
1929.	53
1932.	50
Consumed by Evansville business firms	
1929.	26
1932.	25
Consumed by Evansville residences	
1929.	18
1932.	22
Evansville street lighting	
1929.	3
1932.	4

^aData based upon personal interviews.

^bProduced by the Southern Indiana Gas and Electric Corporation, 1929, at Evansville.

^cThe chief extra-Evansville urban customers were as follows: Arthur, Booneville, Chandler, Darmstadt, Daylight, Ft. Branch, Haubstadt, Holland, Mt. Vernon, Newburg, Patoka, St. Philips, and Winslow.

cent of its products. This was in keeping with the fact that the Area was primarily agricultural (Corn and Winter Wheat Belt); secondarily mining (much coal, adequate supplies of run-of-the-mine sand, gravel, building stone, a bit of gas); and thirdly, lumbering

treatise--the designation of an area dominated by Evansville.

(which though spotty was still important to the Component, but which formerly was widespread and of great value to it).

Historical Role to Manufactural Evansville

The (large, isolated, and dependent) Tri-State Area abetted Manufactural Evansville by participating in the city's retail and wholesale trade, some of it redistributive, and thus stimulated the Component's diversity in products. The Component absorbed some of the material moving in the trade; contributed products to it; followed trade leads opened by it; and, from the business, obtained funds and leadership.

During the period of flourishing steamboat trade, many of the river towns of the Tri-State were served directly by Evansville packet lines, and a smaller number were served by other Ohio River lines as well. Salesmen generally operated but short distances inland from these river towns--although some salesmen made long trips by wagon or saddle to non-river centers.

With the rise of railroads and the decline of steamboats many of the smaller river towns lost the service of through steamboats; but Evansville packet service to some of the larger river towns of the Area lingered long (into the nineteen-twenties). These fortunate towns, served by river and in part by rail, became in turn sub-centers of distribution to centers and areas with poorer conveyance service. Salesmen from Evansville sold to jobbers, in such sub-centers, Evansville goods also goods obtained by Evansville by rail and by steamboat. In adjustment to its location near the mouths of a number of tributaries of the Ohio River, Evansville had become a small commercial node. As we said, this nodular development helped to stimulate Evansville manufacturers to produce a large variety of products--to help process the entrepot material and to meet the varied demands of the Tri-State Area, and elsewhere. The decline of the jobber business in the Area (and elsewhere), incidental to increased highway service, is modifying Manufactural Evansville's sales methods and lines of production.¹

¹For example, retail establishments in the Tri-State increasingly are motoring to Evansville factories to buy furniture by sight.

Section 3. In the United States

The fates of Evansville and her manufactural component are so intricately interwoven that discussion of their setting in the United States (beyond the Tri-State Area) can be presented advantageously, in part, in terms of the setting of Evansville.

It is a truism that the size of a city is resultant partly upon its setting in large dimension. For example, the setting of Chicago is superior to that of Evansville. In short, the national setting of Evansville is of major importance to that city.

It behooves the personnel of a city to grasp effectively the challenges afforded, from time to time, by its setting en-gross, e.g., one of the problems is that of securing effective conveyance contact with the "outside."

In more than one instance the people of Evansville have grasped well an opportunity afforded by its setting. For example: Evansville's setting made it important that it become an Ohio River gateway crossing between the North and the South. It was fortunate that Evansvillians, Evansville, and Vanderburg County indebted themselves sorely (about \$1,000,000) to secure north-south railroads early, while railroads were pioneering.¹ Largely thus Evansville became the southern terminus of a railroad (the ancestor of the Chicago and Eastern Illinois); and likewise later she helped herself to become a second (northern) terminal (Louisville and Nashville Railroad). Junction of those two railroads at Evansville made of it, in effect, indeed an Ohio River crossing, i.e., a gateway (even though the actual bridgmen of the river, at nearby Henderson, loitered until 1885, the while railroad ferry service had to suffice). The then small city of Evansville had thereby crossed its riddle to a larger career.

The hub of Evansville's setting in the United States is the province between the Mississippi River and the Appalachian Mountains, and the core of the hub is what is herein termed her Neighborhood States: Indiana, Illinois, western Kentucky, and western Tennessee.

¹Frank M. Gilbert, History of the City of Evansville and Vanderburg County, Indiana (Chicago: Pioneer Publishing Company, 1910), I, 403. The debt proved to be a longtime burden, and involved the loss of some personal fortunes.

Her Ohio River Setting (in the United States)

Evansville's location at the junction of an artery and a minor corridor challenged her to become an Ohio River gateway, whereby her manufactural Component profited.

In the Ohio River Artery.--The Ohio River Artery has been a major traffic artery (Fig. 21). Located alongside of it, on her terrace, early Evansville nourished from, and contributed to, the flow of traffic between Pittsburgh and New Orleans. Likewise she participated in the traffic on major tributaries between Louisville and Paducah, among five of which she nested (the Tennessee, Cumberland, Wabash, Green, and Tradewater).

In the Wabash minor-corridor.--The minor corridor threaded by the Wabash River is distinctly not major, but importantly minor. At its southern end, early Evansville struggled, rather ineffectively, to make use of it, in addition to the traffic on the Wabash River. She traded by wagon as far north as Terre Haute, and had some (brief) success in using the Wabash and Erie Canal (1853-65), which joined the Ohio River in a terminal pool in Evansville (Fig. 30), via the mouth of Pigeon Creek (and lost heavily in helping to promote, develop, and operate the canal).

Artery minor-corridor junction.--Finally Evansville tapped the minor corridor, by means of the ancestor of the Chicago and Eastern Illinois Railroad (1853), which threads the corridor as far north as Newport in its route between terminal Evansville and terminal Chicago. Thereby Manufactural Evansville received additional large supplies of farm products and some coal from the Wabash corridor, an important additional sales market, and improved transportation connections with New York.

Ohio River gateway.--Evansville achieved bona fide gateway¹ status in the early 'seventies when it became a northern terminus of what is now the Louisville and Nashville Railroad, and her northern and southern railroads achieved rail connection in that city (Figs. 31 and 32). The railroad ferry service at Evansville

¹Prior to that time there had been minor gateway traffic at Evansville, utilizing poor highways extending southward down the Wabash River Valley and into Kentucky, with ferry connections at Evansville. There was also minor gateway traffic via the Wabash River and the Green River (and other southern tributaries of the Ohio).

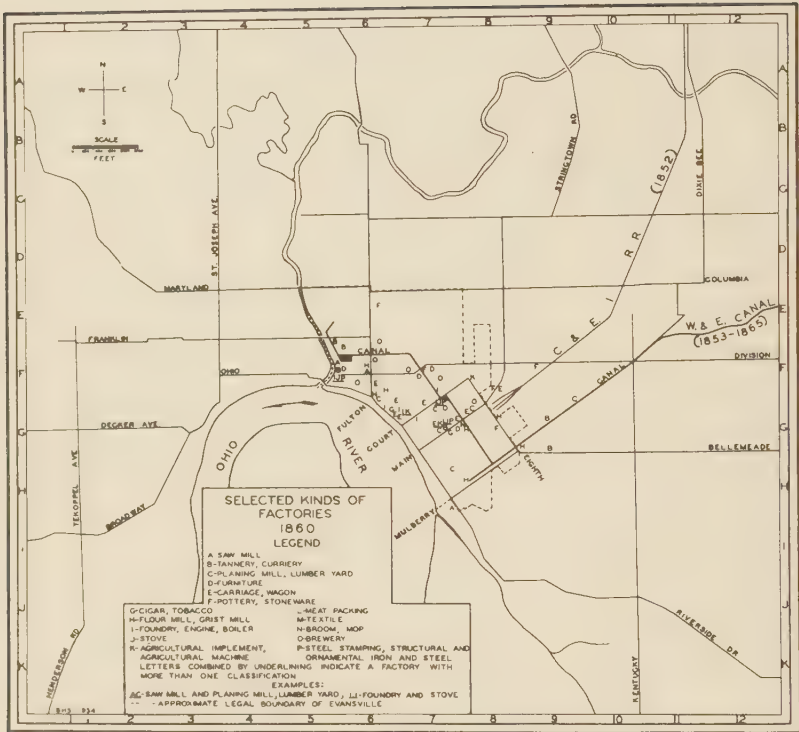


Fig. 30.--Distribution of selected kinds of factories 1860. Attention is directed to: (1) the factories on the banks of the Ohio River, Pigeon Creek and the Wabash and Erie Canal; (2) the two basins of the canal (shown in black); (3) the factories on each side of Fulton Avenue (Lamasco) and Main Street (Evansville); the factories between Evansville and Lamasco (admitted 1857); and the railroad which is now part of the Chicago and Eastern Illinois. (Based on city directories and other historical sources.)

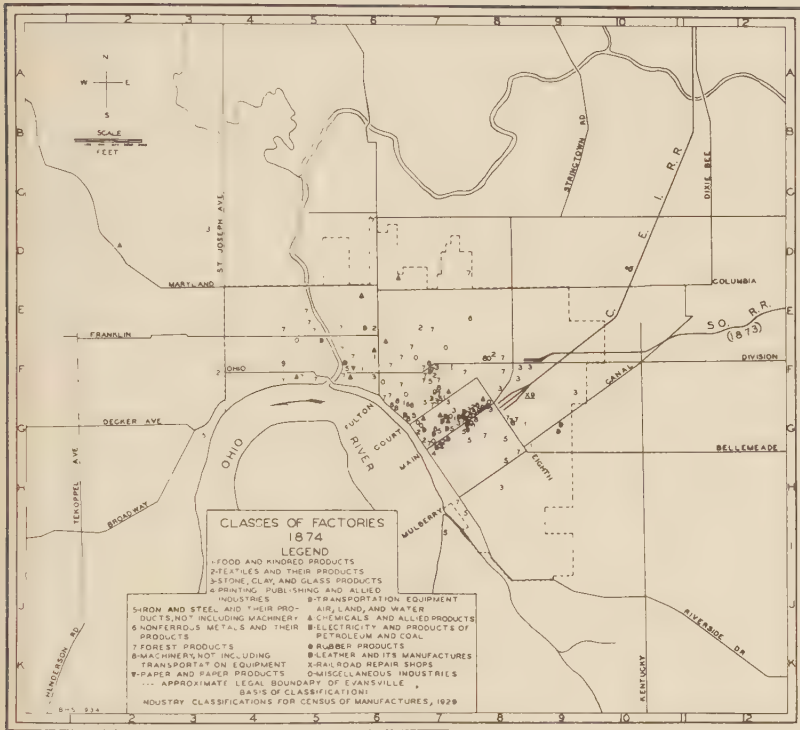


Fig. 31.--Distribution of factories by classes 1874.
(Based on city directories and other historical sources.)

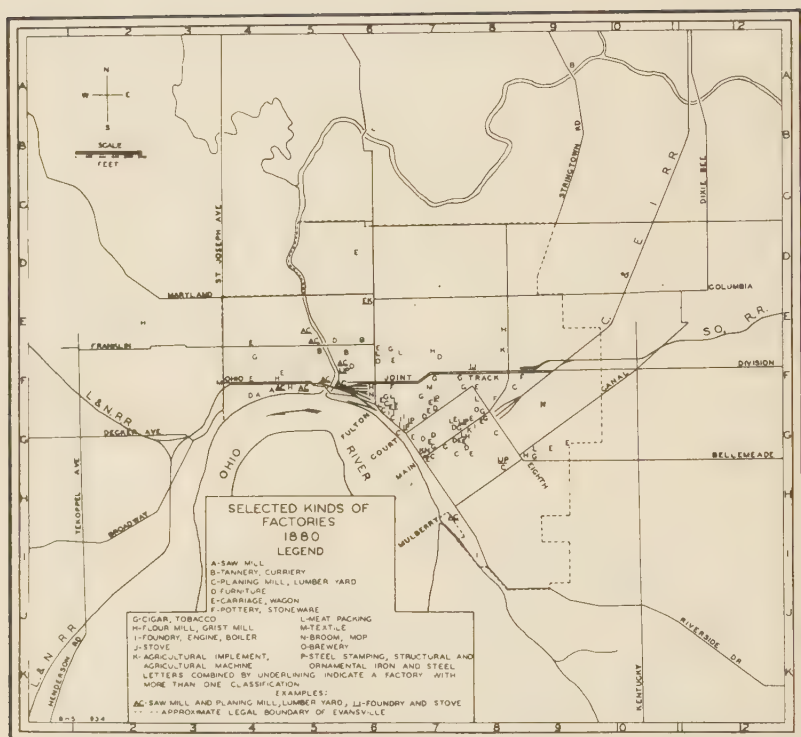


Fig. 32.--Distribution of selected kinds of factories 1880. It is apparent that, by 1880, railroads had become an important item in the relationships of the plants relative to distribution. (Based on city directories, atlases and other historical sources.)

(specifically at Henderson), and the subsequent railroad bridgmont of the Ohio, made of Evansville the only Ohio River gateway city between Louisville and Paducah, a distance of some 350 miles. Nearly two score years ago, Harlan H. Barrows cited the importance of this railroad crossing to the growth of Evansville. Opened thus to Manufactural Evansville, by the two railroads and the Southern Railroad,¹ which entered Evansville in 1873, was vast "inland" territory, largely independent of the territory which had already been opened by river transportation. In addition Evansville became a freight-rate breaking point (until the middle 'twenties), and to some extent, a freight exchange and breaking point, by virtue of her gateway and terminal status. The Evansville gateway resembled those of Louisville and Cincinnati, with a smaller volume of traffic.

Corridors and axes.--Evansville is affected by the nature of the artery, corridors, and axes in which it is located. The Ohio River Artery needs no further discussion here. The corridor of that river is a narrow groove which has never promoted important conveyance by land. The hilly topography on both sides of the Ohio Valley, through its north-south grain, has impeded east-west conveyance, which circumstance has been a major impediment to the growth of Evansville into a much higher population size. Conversely, the grain has favored north-south land conveyance; but that in turn has been impeded somewhat by the general hilliness, except in corridors more or less faint. These conditions have backgrounded the development of a conveyance pattern which, in broad measure, persists.

The Wabash Valley minor corridor is a physical feature, a depression from Evansville to Newport, Indiana, whence it diminishes northeastward; it is most pronounced between the hill land of southwestern Indiana on the east and that of southeastern Illinois on the west. The traffic aspect of the corridor trends northward from Newport, through Danville, Illinois, to Chicago, via the Chicago and Eastern Illinois Railroad. The minor corridor, thus in effect extended by railroad, is also a traffic feature, which

¹Evansville in the early nineteen thirties was also a southern terminus of the Big Four Railroad, and was served by the Illinois Central, which operated a railroad ferry at Henderson.

(1) extends from Evansville northward, athwart the east-west "bottle throat" between the Great Lakes and the hilly land north of the Ohio River--to use a term emphasized by C. R. Dryer; (2) tails, near Chicago, into the great traffic belt between Chicago and New York which, not being a corridor, might be called the Chicago-New York Axis; and (3) tails also into the great St. Lawrence Corridor, leading eastward from Chicago toward Montreal. The Axis and Corridor are both major ribbons of traffic, whereas the minor corridor is not; but, in general, the Wabash minor corridor with its associated river and traffic axis, is the most important north-south (although faint) break¹ in the hilly land between Cincinnati and St. Louis. Moreover, its intersections with east-west traffic routes will not be forgotten.

A minor railroad traffic axis leads from Chicago to Evansville, via the minor corridor, and thence branches to Jacksonville-Miami and to Mobile-New Orleans; it is becoming also a trucking axis. Another minor railroad traffic axis leads from Louisville to St. Louis; Evansville is in one branch of this bifurcated axis. Both of these minor axes are important to Evansville.

Her Commercial Setting

General aspects.--Evansville, as of the early nineteenth-thirties, faced trade challenges based upon her central location in the Eastern half of the United States--opportunities and dangers in which the elements of distance and regional variety were almost ubiquitous. Her situation involved close contact with rich territory in many directions, the patronage of which elicited fierce competition among numerous contenders. There were, however, relatively poor spots almost adjacent to her, which were not without increased trade possibilities and were subject to relatively small competition from afar, among such being: the southcentral portions of Indiana and Illinois, the areas enveloping the fertile Blue Grass and Nashville basins, the Ozarks, and the poorly

¹This statement does not impute a comparison between the Wabash route and the route of the Illinois River between Chicago and St. Louis; the latter would scarcely be held to be involved by the statement. Nor does the statement imply a comparison between the north-south Chicago and Eastern Illinois, and Illinois Central, railroads.

drained portions of Arkansas.

Evansville was near the center of population of the United States, and probably near the economic center (uncalculated) as well. Within an area extending radially three hundred miles from that city were about twenty millions of people, occupying manufacturing Evansville's trade heartland; a zone, two hundred miles in depth, enveloped that disk and housed thirty millions more, being her basic zone of more precarious offense and defence. Beyond the zone were outpost promontories and islands, held by means of long lines of operation. Robert S. Platt has emphasized functional connection between distant points. In Figures 11 and 13 are shown the distribution of the chief quasi-terminal and quasi-original points involved in manufacturing Evansville's trading. Inspection of the concentration of points reveals the probable validity of the preceding characterization of the gross structure of her manufacturing trade setting; detailed analysis is reserved for Chapter V. If the products of the dense cluster of factories in Evansville be visioned each as a meteor ejected from specific factory and traveling to a specific terminal point, and the supplies used by those factories each be interpreted likewise as an infalling meteor, all meteors incandescent, there would be presented a display illuminating the space of manufacturing Evansville's commercial setting. Thence might follow intensive regional analysis of the areas thereby brought into relief--in a monograph; but not in an abridgment.

There was also the challenge of Evansville's dually marginal situation: (1) Her location on the southwestern margin of the American Manufacturing Belt, which was becoming an intricate and increasingly vital problem. (2) Her liaison situation between (a) the South, which was agriculturally and commercially major, and industrially minor, but launched at last in manufacturing largely based upon low-price labor and proximity of cotton and certain other materials, and (b) the North, which was of major importance in agriculture, industry, commerce and finance. She had recently encountered stress in her manufacturing trade relationships with the South, and was in some ways seeking easement, of her overall problem, in the Northeast.

Token regional aspects.--Selected regional aspects can be cited as tokens, to avoid lengthy treatment. Thus manufacturing

Evansville's regional trade setting is important with respect to the following of her leading supplies: (1) The Corn and Winter Wheat Belt, as a near source of animals, animal produce, soft wheat. (2) Western part of the Central Wheat Region, as a more remote source of soft wheat (especially pertinent in the cake-flour industry, and in flour for household baking in the South). (3) Central Hardwood Forest Region, as a near source of hardwoods, especially in earlier days. (4) Evansville's relatively ready accessibility to the hardwood areas in the southwestern South, especially in the bottom lands of the Lower Mississippi River (Southern Mixed Forest). (5) The Kentucky and the Pennsylvania tobacco regions; the former especially in earlier days, the latter now. (6) The Eastern Interior Coal Field. (7) The Pittsburgh-Chicago-St. Louis-Birmingham iron and steel quadrilateral, which supplies Evansville with irons and steels at favorable terms largely because of her competitive location therein and its river conveyance freight rate inheritances and potentialities.

Thus, also, her regional trade setting is important with respect to the following of her leading products: (1) Southern Appalachians, whose furniture factories are severe competitors with those of Evansville (Fig. 33). (2) Cotton Belt and the southern half of the Corn and Winter Wheat Belt, as consumers of warm bread prepared from soft wheat flour; also agricultural machinery and implements; wood and coal stoves; beer; and a growing consumer of refrigerators. (3) Mid Continent Petroleum Field, as a consumer of mining machinery and equipment. (4) Northeast Seaboard, as a consumer of iron and steel products for building and scaffolding purposes. (5) Corn Belt, as a consumer of agricultural machinery and equipment. (6) Detroit automobile district, as a purchaser of automobile parts from satellite centers. (7) Chicago mail-order and department store center, as a promoter of decentralized or subsidiary production.

Among Conveyance Ways

Evansville's functions¹ on the southern margin of the most important conveyance way region of the United States, which extends

¹In 1933 railroads led in the conveyance of materials to Evansville. It is estimated that the portion carried by the rail-

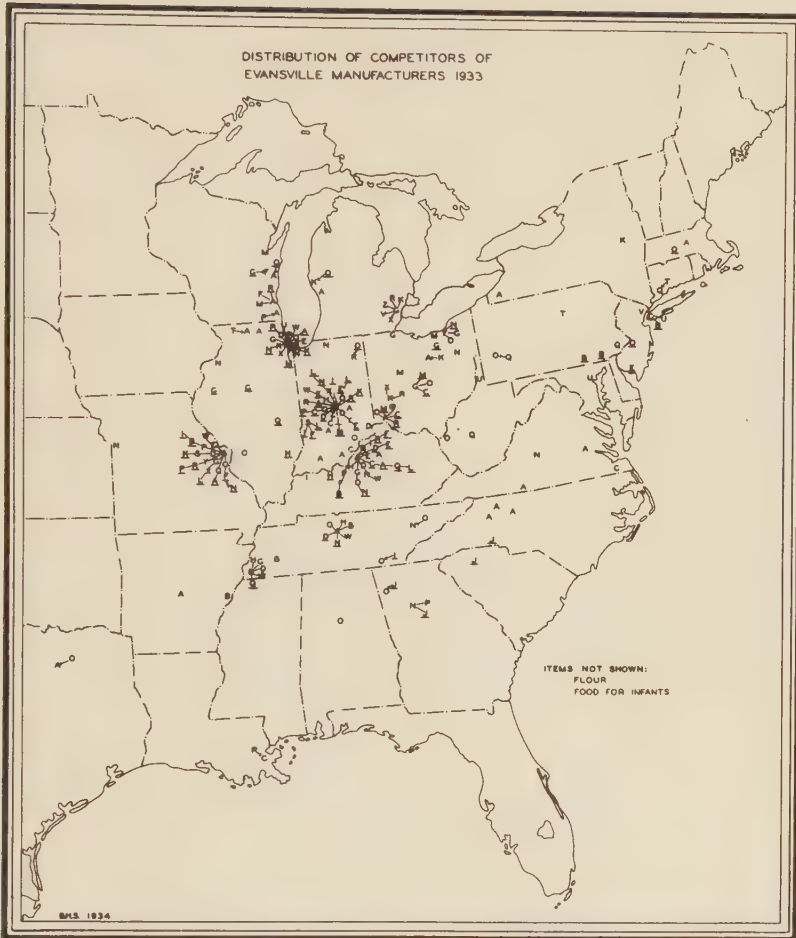


Fig. 33.--Competition against Manufactural Evansville 1933. Turn to Appendix II for key to Figure 33.

eastward roughly from a line joining St. Louis with Milwaukee. This is a disadvantage, distance considered, in competition with many manufactural centers of that region, for trade in it. But it is an advantage over those centers, in general, in competition for trade in the South.

Among railroads.--Evansville's setting in the railroad pattern of the United States is good, scarcely excellent. Her five railroads, with trackage totaling some thirty-one thousand miles, reach directly a large number of important cities located on or east of the Mississippi River; moreover, they connect with other main lines at important railroad junctions, and thus rapid rail service is provided to a vast number of centers in the United States.¹

Her north-south rail setting was in 1933 somewhat better than her east-west, especially her eastward one, largely due to natural features and historical inheritance. However, she had

roads was about four-fifths of the total. Trucks ranked second, with an estimated portion of about one-tenth, and their role was increasing. The portion transported by the river was possibly less than one-twentieth. A still smaller portion was brought in by the electric street railway.

Likewise railroads led in the conveyance of products from Evansville their portion being about three-fourths of the total. Trucks ranked second, their portion being about one-fifth.

A questionnaire revealed the distribution of a factory's patronage, which was then weighted according to the number of its manufactural wage earners. Thus each conveyance way received its rating by means of its total of weighted units. Thus the units of all of the factories were comparable.

¹An estimate of the ranking of the conveyance ways in transporting inbound materials to Evansville for the factories is given in the following tabulation, as of 1933:

- 1st. Louisville and Nashville, tied with Chicago and Eastern Illinois
- 3rd. Illinois Central, tied with Big Four
- 5th. Southern, tied with trucks
- 7th. River; electric street railway

Likewise an estimate of the ranking of the conveyance ways in transporting outbound products is given in the following tabulation:

- 1st. Chicago and Eastern Illinois
- 2nd. Louisville and Nashville
- 3rd. Illinois Central, tied with trucks
- 5th. Big Four
- 6th. Southern
- 7th. Post Office
- 8th. River-rail; electric street railway

fast express with the Northeast by means of special service from the New York Central and the Pennsylvania lines at Terre Haute, where her express was shunted speedily into waiting coaches destined for Evansville, and vice versa. Her connections with St. Louis, Louisville, and Cincinnati were very good.

Among highways.--As of 1933, Evansville's setting in the highway pattern of the United States was fair, and was improving toward better balance. Her highway connections with the network north of the Ohio River were superior to those south of it. In keeping with its topographic setting and historical inheritance, her north-south highways were superior to the east-west. Her inter-regional highway traffic was increasing. By the mid-'forties some forty common and contract motor-carriers operated in and out of Evansville; some reached points within a three hundred mile radius in overnight service.

Among riverways.--Evansville's setting in the Ohio-Mississippi River conveyance pattern is excellent. In 1944, five commercial barge lines served the city. There was interknit rail-river-truck service by means of a modern terminal.

Among airways.--Her airway connections were young and growing. In 1944 she was in the Chicago-Miami route, and was about to be in a St. Louis-Washington route.

In the Freight Rate Pattern

Evansville's setting in the freight rate pattern of the eastern part of the United States was excellent, with some handicaps (Fig. 34).

Class rates.--The railroad freight rates of Evansville in the early 'thirties conformed to those of the Official Freight Classification Territory, in which she is located.¹ In that Territory, in general: (1) The amount of class freight was large,

¹The area of the Official Freight Classification Territory includes, with small exception, that of the Central, Trunk Line, and New England, freight traffic association territories. The areas of the Southern Freight Classification Territory and the Southern Freight Traffic Association are substantially coextensive. The area of the Western Freight Classification Territory includes, with small exception, that of the freight traffic association territories known as the Southwestern Freight Bureau, the Western Trunk Line Committee, and the Transcontinental Freight Bureau.

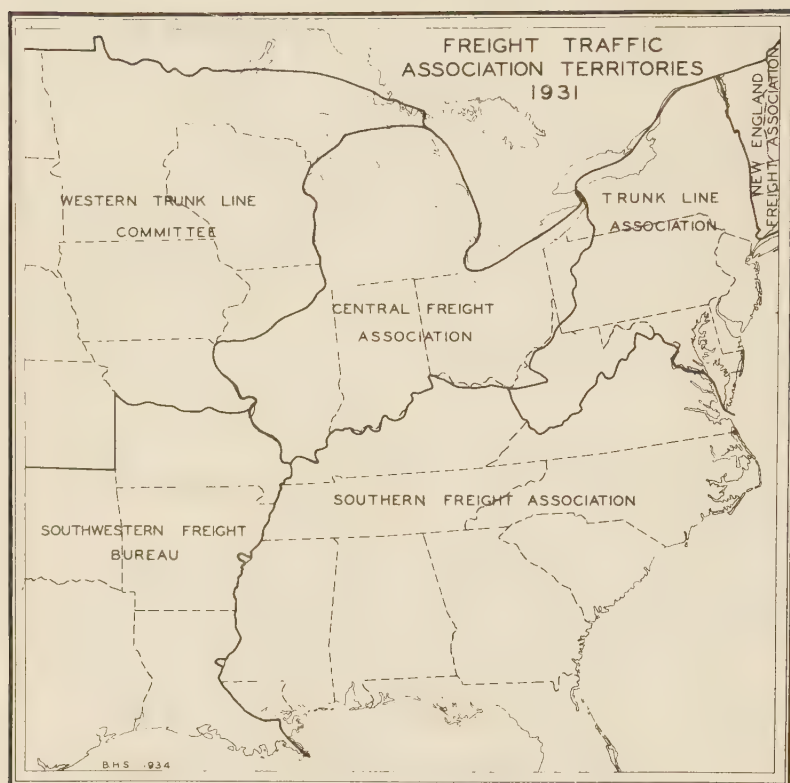


Fig. 34.--Freight traffic association territories 1931. (Based on reports of Interstate Commerce Commission.)

with rates¹ on a basis of parity, distance considered, and were low relative to those of other Territories. (2) The amount of commodity freight was smaller, with competitive rates, less responsive to distance, and were high relative to those of other Territories, especially the Southern. (3) In the Official Territory, the Interstate Commerce Commission was working effectively toward parity of class rates, distance considered. (4) During the period, 1919-30, in Official Territory freight rates advanced in total more than those of other Territories because the advance in freight rates were then made, in large measure, by means of percentage increases upon class rates, whereas commodity rates were affected to a smaller extent.

As a result of these circumstances and changes, culminating in the late nineteen-twenties, Evansville, in class rates, functioned in Official Territory (essentially the northeast part of the United States) in effect on a basis of parity, distance considered. In general, centers in Official Territory competed on equal terms, except for distance. Now, Evansville was located in the southern margin of the Territory and thereby faced distance-handicap--especially in shipments northeastward, northward, and northwestward.

The distance handicap mentioned in the preceding paragraph is a natural trait, growing out of her situation. Formerly Evansville's setting in Official Territory had been masked and complicated by class rate pros and cons. (1) Evansville had suffered from differential freight rates in her shipments toward the Atlantic Coast. Example: Because rates between Chicago and New York had been relatively low, centers near Chicago had enjoyed lower rates than those of Evansville. By 1933 the differentials had been removed. (2) She had profited on her shipments from Official Territory into Southern Territory, and vice versa, by virtue of differential rates growing out of her Ohio River gateway status. By 1933 the differentials had been removed. Evansville ceased to be a rate breaking point in 1926. (3) She had advantaged over many

¹Interstate Commerce Commission, Eastern Rate Investigation, 164 I. C. C. No. 15879 (Washington, D. C., 1930), p. 390.

For more details see the following reports of the Commission: Southern Freight Classification Investigation, 109 I. C. C., No. 203 (1927); and Western Trunk Line Class Rates, 164 I. C. C., No. 17000 (1930).

of her rivals in Official Territory by virtue of favorable differentials growing out of her location in the Ohio-Mississippi River traffic. Example: She advantaged in her shipments to St. Louis and westward and southwestward as far as the Rocky Mountains. By 1933 the differentials had been removed in the three cases cited; but there remained, of course, a pro and con effect inherent in the trade momentum acquired in earlier days the while the differentials were in effect.

Formerly Evansville was grouped with Louisville and Cincinnati in shipments to and from the Southwest. By 1933 she was grouped with St. Louis with respect to such shipments, in effect in Illinois Freight Association territory. She was seeking easement of rates on shipments to and from our Pacific Coast by contending that the southern part of the Chicago and Eastern Illinois Railroad should be in Illinois Association territory because Gary and the northern part of that railroad were. In 1927 Evansville achieved parity of rates with Louisville and Cincinnati with respect to the South.

Commodity rates.--The commodity rates of Evansville in 1933 were as favorable as those of other cities of its population class, located north and south of the Ohio River, with some exceptions. The tendency was toward joint through rates between Territories. Because competitive freight rates on heavy-commodity freight, with slight emphasis on distance, are stressed in the territory of the Southern Freight Traffic Association, Manufactural Evansville was at some disadvantage in competing with Southern centers for trade (1) in the South, (2) to some extent in the Eastern Seaboard. That the city enjoys favorable commodity rates on a large number of items is due in part to (1) its conveyance pattern setting, (2) its large volume of manufactures, (3) its manufactural momentum, and (4) effective research in the traffic department of the Chamber of Commerce.

Among Manufacturing Centers

It is possible by means of statistical analysis¹ of a non-unique city's manufactural setting to isolate important aspects

¹Statistical analysis is being emphasized increasingly in geography, as, for example, by Wellington D. Jones and Ellsworth Huntington.

of the city's manufactural component--among others to ascertain something of the component's manufactural emphasis, i.e., what elements on which it relies greatly in its manufacturing structure, and even to arrive at preliminary hypotheses concerning its manufacturing level,¹ although such hypotheses require testing by other means.

Rank among American cities.--What was Evansville's standing among manufactural centers in the United States as of 1929? A preliminary estimate was obtained by using, as a diagnostic, Evansville's rank among American cities. She ranked 88th in population; 100th in total expenditures for manufactural wages (not wage scale, not price of wages); 97th in total expenditures for materials (not price); 159th in total expenditures for fuel and purchased electric energy; and 106th in the item, value added by the process of manufacture. Now, what was the relative intra-rating of those elements, i.e., the ranking of each element (item) as compared to the others? By using the ranking in population as a norm, and expressing it as a score of 100, the other items were made comparable by transmutation, thus making them comparable in terms of percentiles, in effect an expression of their intra-rating, viz: population, 100; number of manufactural wage earners, 109; total expenditures for materials, 91; total expenditures for manufactural wages, 88; value added by manufacture, 83; and total expenditures for fuel and purchased electrical energy, 55. Interest was aroused by the high score of the item, number of manufactural wage earners, compared to the much lower score of the item, total expenditure for manufactural wages, thus suggesting investigation of the item, wage scale, price of labor. Interest was also aroused by the strikingly low score of the item, total cost of fuel and purchased

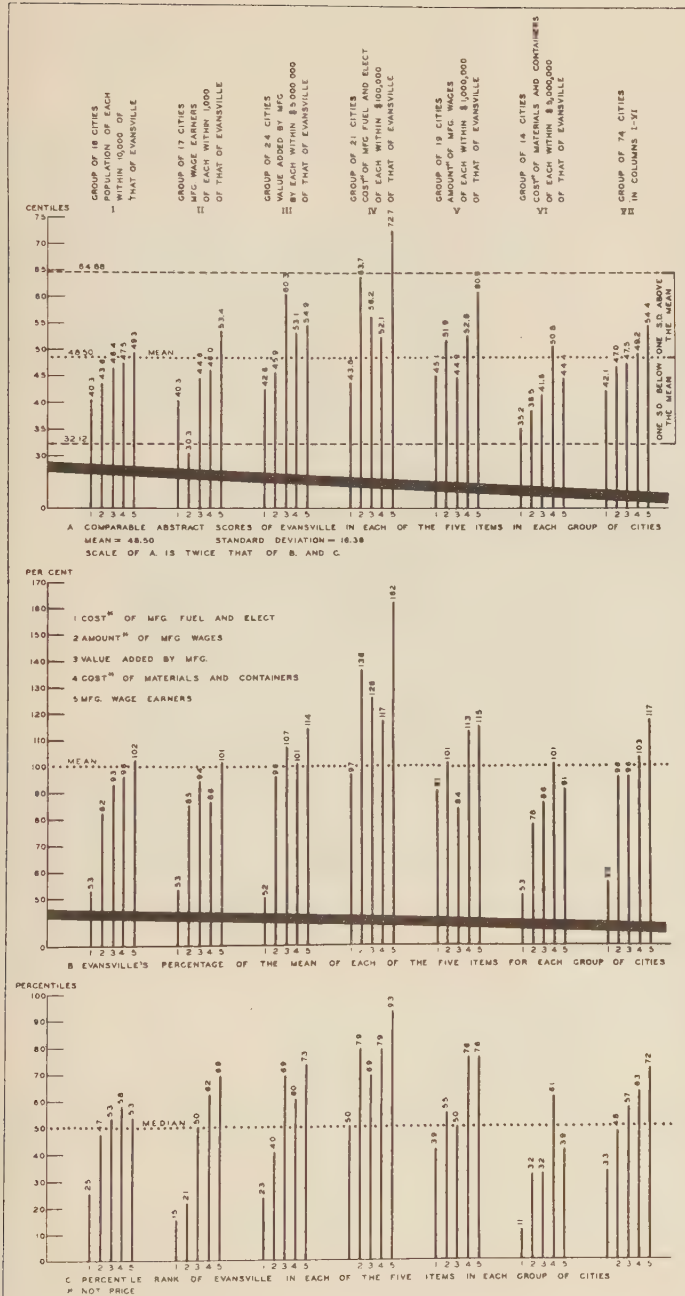
¹The level attained in manufacturing, as measured on a scale graduated in units expressing such level by percentages. Herein is meant the percentage ratio of the item, value added in the process of manufacturing, to the item, cost of supplies (materials, fuel, purchased electric energy, materials for containers for the products, and purchased containers for products--more recently has been added the expenditure: cost of contract work). Examples: The commercial processing of wheat at a grain elevator is a form of manufacturing with a low manufacturing level. The manufacturing of high class Swiss watches is a form of manufacturing with a high manufacturing level.

A number of such terms have been "invented" as an aid toward verbal precision in this treatise.

electrical energy, compared to the norm score of the item, population, thus suggesting investigation of the item, price of fuel. Interest was also aroused by the relatively low score of the item, value added by the process of manufacture, compared to the somewhat higher score of the item, total cost of materials, thus pointing to investigation of the item, manufacturing level. One surmised: (1) Somewhat low manufactural increment, accompanied by manufactural emphasis upon materials; (2) implemented by low price of fuel; (3) implemented also by somewhat low wage scale; (4) aided by buying at prices a bit advantageous. Further investigation lent support to the first three of these surmises.

Standing among cities of her class.--Next, investigation proceeded to cities of Evansville's class in each of the six elements discussed in the preceding paragraph. There was a group of eighteen cities, the population of each of which was approximately 100,000; there was a group of seventeen cities, each of which deviated but little from Evansville in the item, number of manufactural wage earners; etc. In the six groups 113 cities are listed (74 different cities). They were the cities of Evansville's class.

For each of the groups the ranking of Evansville was obtained for each of the six elements. These rankings were transmuted into comparable terms, or scores (Fig. 35-A), and consolidated (Fig. 35-A-VII). This consolidation is a summary of Evansville's standing among the (74) cities of its class with regard to five manufactural elements, by means of comparable, abstract scores transmuted to a mean of 48.50, with a standard deviation of 16.38. In short, Evansville's standing was as follows: (1) number of wage earners, 54.4 (i.e., 5.9 points above the mean of 48.50); (2) total expenditures for materials, 49.2 (very close to the mean); (3) value added by manufacture, 47.5 (a bit below the mean); (4) total expenditures for manufactural wages, 47 (1.5 points below the mean); (5) total expenditure for fuel and purchased electrical energy, 42.1 (6.4 points below the mean). These results substantiate the first three surmises obtained in the diagnosis under the preceding topic, "Rank among American Cities," namely, somewhat low manufactural increment; implemented by low price of fuel (of which Evansville uses a normal amount); implemented also by a somewhat low wage scale. As for price of



materials, it would seem that Evansville bought at about normal price.

In subsequent field work at Evansville, and in studies of comparative prices and wage scales, the results in the preceding paragraph were, in general, substantiated. The relatively low price of fuel grew out of proximity of coal. The relatively low wage scale grew out of Evansville's situation in the United States, and appeared to be substantially in keeping with it, as is emphasized by Figure 36. Her manufactural wage scale was higher than that of many Southern cities and lower than that of many Northern cities, essentially in keeping with her relative cost of living. Evidence was obtained to support the opinion that Manufactural Evansville, with striking exceptions, emphasized (somewhat) quantity production--which is another way of saying that her manufacturing level was a bit low (in 1929). Later it was ascertained that levels change in the course of manufactural evolution, and that the level of Manufactural Evansville was not unique. It was learned also that her level was higher than that of the average for the United States. There was also evidence that Evansville's level was rising, because the percentage increase in the item, value added by manufacturing, was greater than the percentage increase in the item, value of products, both based upon 1914 as a norm. The manufacturing level is treated more fully in Chapter III.

General standing.--It is alleged that Evansville, compared to the North, emphasized (somewhat), with exceptions, quantity production of goods, based in large measure upon: low price of fuel; relatively large numbers of manufactural wage earners, who received relatively low wages, which were in keeping with Evansville's situation in the United States; normal price of materials; and products which in price were not higher than moderate.

In the Wealth Pattern

Manufactural Evansville functions in the southwestern margin of the most important wealth belt in the United States, which covers most of the area staked out by Milwaukee, St. Louis, Baltimore, and Portland, Maine. This belt has become the most powerful trade magnet of Manufactural Evansville, despite her distance handicap with respect to the northeastern portion of the belt. She also

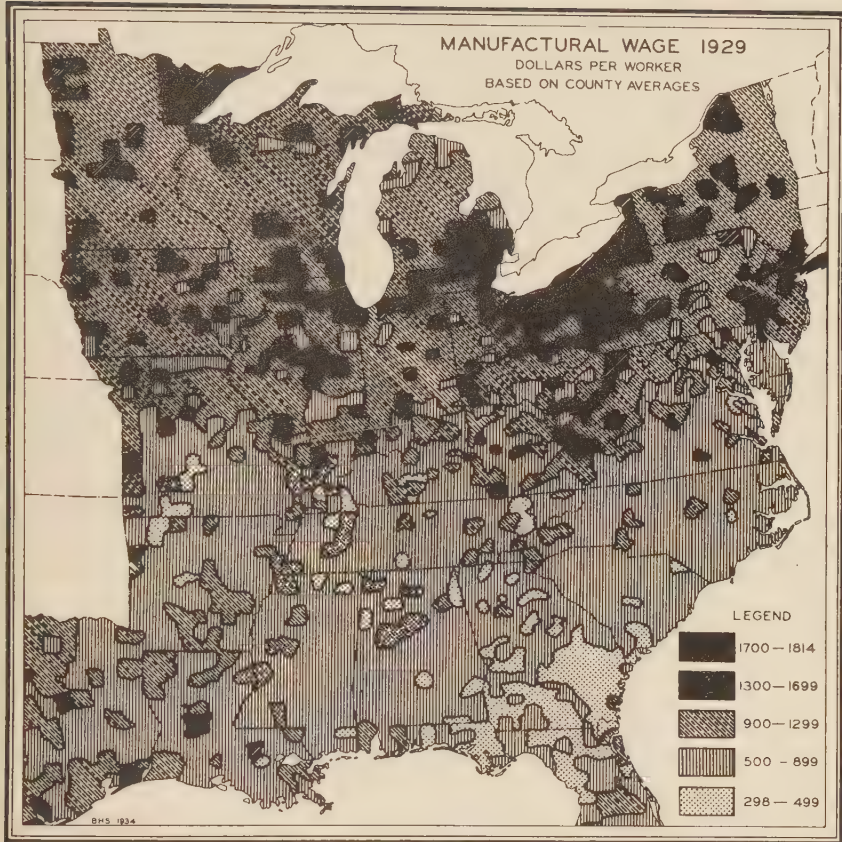


Fig. 36.--Average annual manufacturing wage by counties 1929. The average annual manufacturing wage of Evansville is in substantial accord with its location in the eastern half of the United States, between the Gulf of Mexico and the Great Lakes (Based on data from Bureau of the Census: Fifteenth Census of the United States, Manufactures 1929).

functions on the northwestern margin of the South, which has far less developed wealth. But in the South, Manufactural Evansville did not encounter the mass of indigenous manufactural competition prevalent north of the line of the Ohio River. In catering to the South, the Component stressed, with exceptions, low-price class products (not low quality at the price), e.g., in some stoves, clothing, furniture, etc. This circumstance affected considerably the texture of the products of Manufactural Evansville.

Financial alignments.--The wealth of the belt is affecting the financial alignment of Evansville's manufactural Component. Prior to the twentieth century, almost all of Evansville's manufactural establishments were anchored financially in that city. By 1929, forty-five per cent of her manufactural wage earners worked in concerns which were dominated financially from without that city, chiefly a Milky Way constellation of about a dozen urban centers, extending from St. Louis to New York, in the great wealth belt of the United States, especially Chicago, Detroit, and New York. Prominent among the kinds of concerns exerting financial control of factories from without Evansville were public and quasi-public utilities, mail order corporations; corporations dealing with food, automobiles, clothing, and refrigerators.

This influence from without the city was changing the structure of Manufactural Evansville, through (1) consolidation of manufactural establishments; (2) introduction of "foreign" personnel, chiefly in management, secondarily in advertisement, salesmen, and labor; (3) intensification of organization; (4) competition for personnel; (5) decrease in personal contact between capital, management, and labor; (6) change in methods; and (7) changes in local leadership.

In Our History

Evansville has contributed to, and been conditioned by, the history of our country, especially by its great movements. It was the city's fate to develop in the midst of the development of the Midwest, highlighted by the shifting of the latter's main trade outlet from New Orleans to New York. The city's chief extra-Evansville trade was conditioned successively by forms of conveyance: flatboat, steamboat, train; it is being influenced increas-

ingly by motor-trucks and airways. The city and its Component were affected greatly, with net results, by the Civil War and World War I; Great Boom I in the late nineteen-twenties; depressions between 1820 and 1840, and Great Depression I of the early nineteen-thirties.

Evansville proved itself alert to grasp many of its opportunities, especially by promotional investments: to develop local packet lines, and to serve the Ohio River packet lines; in helping to secure railways, also the railway and highway bridge-ments of that river; in encouraging new lines of manufacturing, from within and without. Seemingly the personal factor has been above average, especially in planning and quasi-planning.

Its longtime leading manufactural industry, woodworking, has been influenced greatly by the successive exploitation of the Mixed Northern Forest, the Central Hardwood Forest, and the Southern Mixed Forest, and it is feeling the exploitation of forests on the Pacific Coast, and in the Gulf and Caribbean countries. In its pivotal position, it has reacted to economic conditions in the South and the North, by modifying its manufactural trade alignment, and expectedly will do so again.

Liaison Situation

Her liaison situation in the eastern part of the United States has been, and will remain, ubiquitous, potent, underlying masking circumstances and events of a given epoch seemingly greater. Apparently her fundamental hinterland will continue to be her Neighborhood States and their enveloping borderland.

CHAPTER III

EVOLUTION¹

Various aspects of evolutionary Manufactural Evansville appear in Chapter II. In Chapter III interest focusses primarily upon both the course and the stages of evolution, and secondarily upon the geography of the Evansville area at the time of settlement and early growth.

The theoretical stages of youth, maturity, and old age are defined and analyzed. Next the stages and curve of Manufactural Evansville's evolution are stated, analyzed, and summarized. Finally, the periods in the historical growth of Manufactural Evansville (based upon the evolutionary course) are stated, and a skeleton of the geography of early Evansville, germane to the evolution of Manufactural Evansville, is presented.

In addition to demonstrating the existence of discernible order in the growth of Manufactural Evansville, Chapter III reaches another important conclusion, based largely upon the stages and the curve, namely that the stage of old age appears to be distant, and, therefore, that the time of possible demise of extensive manufacturing in Evansville lies happily remote. Furthermore, recommendations in the form of measures designed to further the postponement of old age, are presented.

Section 1. Theory

What are the theoretical stages in the evolution of a

¹This chapter consists of a severe abridgment of two chapters in the unpublished larger work. One of the chapters deals with the evolution of Manufactural Evansville in general; the other, with the evolution of twenty selected categories. However, findings and conclusions from the two chapters appear at appropriate places throughout this treatise, and certain tables appear in Appendix I.

Historical geography, as developed by Harlan H. Barrows, is a powerful means of research. Its findings, applied to the geography of the present, help to illuminate it. Charles R. Dryer was wont to emphasize a point of view that geography deals with the present in the light of the past.

normal manufactural center like Manufactural Evansville?

In order to select a convenient basis for defining the theoretical stages, it will be profitable here to recall the principal adequacies or requirements of a manufactural center.

The first three requirements to be listed form a triad; and they are named herein "lands." The first adequacy of the triad is the source land of productivity whence come all of the supplies, namely, (1) fuel and power, (2) ubiquties, such as water, (3) materials, raw, partly finished and completely finished, to be used in the manufacturing process, and, finally, (4) containers in which to package the products manufactured in the center. The second adequacy of the triad is the manufacturing land where the materials are converted into manufactured products and from whence all such products are shipped. Commonly the word factories stands for this second adequacy. But the term, manufacturing land, means more than merely the factories of a manufactural component of a city. In addition to the plants, their equipment, their approaches and their land not built upon, the term includes the site of the plants and their setting in the city. Moreover, it includes such aspects of the setting of the city as are related to manufacturing therein. The third adequacy of the triad is the destination land of consumptivity, whither go all of the manufactured products; it is the market. Another adequacy interlaces the triad, namely, the system of conveyance ways connecting the manufacturing land with the source land and the destination land.

There are other adequacies including labor, management, capital, technology, advertisement, and other aspects of the human element. Commercial, legal and other forms of organization also exert at times a marked influence on the character and growth of a manufactural center.

Now the two adequacies, source land (supplies) and destination land (market), are relatively highly fixed, especially in the matter of distance between them; therefore they are basic. For this and other reasons they form a convenient and practicable basis for defining theoretical stages in the evolution of manufactural centers.

A manufactural center strives to avoid the depletion of its supplies and glutting of its market, because either circum-

stance would be fatal. Therefore, it is assumed that absolute limits are: one-hundred per cent adequacy (of supply and market) on the one hand, and absolute inadequacy on the other hand.

The manufactural stage of youth is characterized by incipient exploitation of the resource land (supply) and the destination land (market). Much of the adequacy is likely to be potential, i.e., untapped. The potentials are commonly large. In the stage of maturity, the adequacies are being exploited in full activity, and the manufactural trend is toward a climax point, or circumstance, of complete utilization of all potentialities. In the stage of old age, potentials have disappeared, in effect, and the supply-market combination of adequacies is nearing exhaustion, although demise may be deferred long by slow-down. In any stage there may be rejuvenescence or untimely senescence.

In this theoretical cycle dealing with realities, there is an ubiquitous, potent element, distance, i.e., distance from the manufacturing land both to the source land and to the destination land. This element, distance, is a tangible and fairly reliable, though crude, diagnostic of costs. Of course the more nearly ideal tool is the item, cost of conveyance. But the latter discloses many a quirk in investigative work. Stated in terms of distance, which is a limited, but useful, means of definition and measurement, the stages in the cycle are as follows: (1) In the stage of youth, the item, distance, is relatively small, commonly--distance from supplies; and, or, distance to market. A youthful manufacturing center may be functioning largely because its supplies are in large measure available in its vicinity (mostly indigenous locally, or otherwise available at low cost); its market may be local, or distant, or partly both--commonly, in large measure, local. But a youthful center may be functioning largely because its market is in large measure local (mostly indigenous locally, or otherwise available at low cost); its source of supply may be local, or distant, or partly both--commonly, in large measure, local. Also, a youthful center may be functioning largely because both its source land and destination land are local (in distance, or otherwise available at low cost). Of the three types of youthful manufactural centers heretofore described, the last is the run-of-mine type evolving as a component of

a non-unique city. (2) Commonly¹ a vigorous, youthful manufacturing center passes into a stage of maturity by expanding the element, distance, with regard to supplies, and, or, markets. The climax of maturity is the attainment of the point, or circumstance, of longest lines of vigorous and effective operation (more nearly correctly, a circumstance known as the point of diminishing returns). In the cycle of erosion by streams, the lowering of the altitude of the sourceland of the stream by erosion is more common than the rising of the sea-level; and, therefore, the altitude of the headwaters is commonly stressed in analysis. Similarly, in the manufactural cycle, the increase in distance from the source of supply is held to be more critical than increase in distance to market, partly because the former circumstance exposes the manufactural center to competitive inroads into its non-distant market, commonly assumed to be relatively impregnable. The mature manufactural center strives to keep short its lines to resourceland, and extend its lines into destinationland, the while it holds its non-distant market. In addition to the element of momentum, there is pride in maintaining markets strikingly distant (alleged proof of "vigor"); there is also the temptation to "dump" or "unload" beyond the destinationland held to be secure. (3) In old age, distance normally ceases to be increased, except sporadically. Rather, there is tendency toward shortening of the operational lines--unless perchance there is enriched creative activity in the manufacturing plants, in the objectives and processes of manufacturing. But, for the moment, distance alone is the center of analytical attention. Now, shortening of lines is more difficult in buying than in selling because the lengthening of the supply lines had been compelled by recession and part-depletion of desirable supplies, whereas lengthening of the market lines had been more or less welcomed. A tendency in successful old age is to find easement of the distance-factor by various means. Unsuccessful old age is attended by eventual demise of the manufactural center, absolute or in effect, as witness the

¹It is conceivable that a manufactural center serving a completely isolated, small island might run the gamut of its cycle from youth, through maturity, into old age, with the element of distance remaining constantly small. Other exceptions are conceivable.

fate of many a saw-milling center in the lumbering industry of the Great Lakes region.

Distance alone considered, the course, or curve, of a manufacturing center in its career is likely to be a parabola, with minor circumstances operating to make it parabolical. But distance is not the only evolutionary factor, and therefore the parabolical curve is compounded with other ones. The curve, in reality, is the resultant of some factors which tend to raise it, and of other factors which tend to lower it--in effect a continual process of rejuvenescence and senescence. The curve of a long-lived manufacturing center may become flattened at the top, with minor plateau and hilly stretches, and some canyons, and swales. It may even, in effect, simulate a reversed parabolical curve. Illustration of the preceding statement is seen in the fact that severe competition tends to force a manufacturing center to lower its selling-prices to a point of depression, even to a point of premature senescence. On the other hand, the injection of new industries into the manufacturing center, and the introduction therein of sound innovations, and improved technology, tends in each case toward rejuvenation. The latter is strikingly true in the case of improvement in the creative activity at the factory.

The preceding phrase, "creative activity," refers to an item which is largely expressed, in limited fashion, by the term, money-value added in the process of manufacturing, and which is commonly known as the manufacturing increment. The quantity, value added in the process of manufacturing, is the difference between the item, value of products, and the item, cost of supplies (heretofore defined). In moderate measure, the "value added" is the money-difference between output and input of stuffs. "Value added" is a crude measure of the economic status of the products above that of the supplies of, and through, which (not machinery, etc.) the products were made--crude because the manufacturing increment is masked by fluctuations in prices, wages, money-value, booms and depressions, competitive circumstances, etc. Now, the percentage-ratio of the manufacturing increment to the cost of supplies is herein termed the manufacturing level, a useful index. Examples: In 1933, the United States as a whole achieved a manufacturing level of 21 per cent in butter; 24 per cent in meat-packing; 31 per cent in flour; and 300 per cent in machine-tools (Table 8).

TABLE 8

UNITED STATES MANUFACTURING LEVEL 1933^a

United States Manufactural Class	Per Cent ^b
Food and kindred products.	57
Textiles and their products.	90
Forest products.	183
Paper and allied products.	79
Printing, publishing and allied products	358
Chemicals and allied products.	118
Petroleum and coal	46
Rubber	46
Leather.	81
Stone, clay, and glass products.	330
Iron and steel products, except machinery.	76
Non ferrous metals and their products.	67
Machinery, not including transportation.	162
Transportation equipment	103
Railroad repair shops.	164
Miscellaneous.	68
United States as a whole	86

^aCalculated from statistics from: Bureau of the Census, Biennial Census of Manufactures 1933 (Washington: Government Printing Office, 1936), p. 21.

^bPercentage ratio of manufactural increment to total cost of supplies.

In 1929, Kansas City, Kansas, exhibited a manufacturing level of 22 per cent, whereas that of New Britain, Connecticut, was 220 per cent. In ancient times China was noted for its relatively high level; in modern times, Europe. By the way of precaution, it is emphasized that the manufacturing level is not a measure of profits.

Evolutionary stages can now be restated in terms of the curve of the manufacturing level of the manufactural center. The curve is likely to be parabolical, whilst the center runs the gamut from youth to old age (but the curve may be masked by a number of circumstances): (1) In early youth the center's level tends to be high; but not very high, by virtue of moderate consumptivity of its market, moderate capital, scarcity of labor, and brief experience in manufacturing. The proximity of supplies tends to raise the level by virtue of relatively low cost of supplies

(through low cost of conveyance). Moreover, if the manufactural products are largely innovational, competition is low. Moreover, manufactories are rarely launched if potentials are not seemingly high. The level in later youth is prone to rise a bit. (2) In late youth and early maturity, prior to pronounced recession of supplies, and prior to mounting competition, the manufacturing level of the center tends to rise, in part in response to increase in market-consumptivity, manufacturing experience, manufactural¹ experience, and decreased scarcity of manufactural labor as the population of the city rises. In these epochs the manufactural emphasis is largely upon materials, i.e., exploitation of materials, with relatively low quantity of processing, and with large turnover (although there may be high quality, e.g., flour, packed meat, "bee-hive" coke). These epochs, emphasizing materials, are somewhat akin to the epochs of pronounced exploitation of natural resources in the earlier phases of American history, in which the quality of loss was large, but in which the quantity of real waste fell far short of the quantity assumed to have been the case. (3) In late maturity (after the climax), and in unsuccessful old age, the manufacturing level tends to decline, due in large measure to increased costs incurred by recession of supplies, although there commonly are other factors also, such as lowered prices due to competition, improved technology of competitors, and the general undertow toward standardization. In "successful" old age the manufacturing level is likely to maintain its altitude fairly well, for a long time. The latter circumstance is, in effect, a postponement of unsuccessful old age; the curve in toto lengthens, and hence flattens.

Not all centers can achieve "successful" old age. In some instances such success is achieved by mutation into, and introduction of, lines of manufactures which exploit supplies and markets more readily accessible. In some instances easement is achieved by raising the manufacturing level, i.e., by placing the manufactural emphasis upon the creative productivity of the factory (in

¹Here a distinction is made between the two words. By manufacturing experience is meant the creative function in the factory's productivity, which involves the use of design, improved personnel, improved machinery, increased capital, etc. By manufactural experience is meant a wider term, i.e., buying, processing, selling, conveying, financing, etc.

effect, upon the products instead of mainly upon the materials). This is done largely through a rise in the skill of designing, and, or, the skill of personnel, and the adequacy of machinery. Or, the success may pivot upon improved advertising, improved selling, etc. The quantity of production may fall, though not necessarily.¹

The relative simplicity of the parabolical curve as affected by distance and the manufactural emphasis, revealed by the manufacturing level, is complicated by a number of factors. Among them are advertisement and concept of value. The consuming public may deem certain products to be truly cheap at a high price, e.g., some of each of the following: patent medicines, vitamins, cosmetics, health foods, etc. But, in case that the price is really dear, there is a coincident rise in the manufacturing level (because of unduly high prices), with relative freedom from strict manufactural adequacies in general (great easement), and manufactural trade-distance in particular. It is commonly granted that the chief function of advertisement is to increase consumption, which attainment may be accompanied by lowering of prices. It is alleged that in some cases advertisement seems to increase the public's concept of value to the level of the quasi-fictitious ("cures"--"style"--"charm"--"halitosis"). At any rate, laws have been passed to curb untruth in advertisement on the containers. A large number of nationally distributed products are of a high manufacturing-level, at a reasonable price.

It is stated, by way of summary, that among the additional factors which mask the parabolical curves are (1) new industries,

¹The price-level of such products is likely to be relatively high. In 1933 the manufacturing level of refrigerators was 103; agricultural implements, 150; pottery, including porcelain wares, 258. It is alleged that, with high price-levels, distance becomes relatively less important because the amount of materials per dollar volume of products is relatively small, and the manufacturer can absorb some of the freight costs in outgoing shipments (if necessary). It is an interesting allegation.

In old age a center, in many instances, has the advantage of accumulated capital, personnel with aptitude for training, labor in relative abundance, a sturdy manufactural trade pattern, and manufactural momentum, each and all of which aid in conversion to a higher manufacturing level.

Rejuvenation, by means of injection of higher levels, may occur at any stage.

(2) salesmanship, (3) transportation rates, (4) innovations, and fluctuations in (5) consumptivity and (6) competition.

Section 2. Stages and Periods

Manufactural Evansville's evolution followed, in the main, the normal curves which have been outlined in Section 1. In the early nineteen-thirties she had attained a stage of maturity. She was still vigorous, and was rejuvenating, under the masking effect of the great depression. But her main evolutionary curves were complicated by a number of minor ones. They largely grew out of Evansville's early wholesale trade; her gateway advantages; cheap coal; her Tri-State, liaison, and regional setting; her men; the march of events; etc. Thus, in gross perspective, her evolution exhibits striking individuality superimposed upon normalcy.

In the difficult art of communication between minds without undue annoyance, a number of tables are introduced at this juncture, to be used in presenting a generalized-detailed picture of the manufacturing curve of Manufactural Evansville, prior to a statement of her evolutionary stages. Table 9 presents statistics for a manufacturing-level curve, 1859-1939, for overall generalization. Tables 10-15 reveal, for specific dates, cross-sections of her manufacturing performance. After their presentation will follow a summarizing discussion of the manufacturing-level curves of each of 26 categories, constructed from data in the preceding seven tables. Finally, in Table 16, appears a sort of historic panorama of the careers of 27 categories. All of this will be less lengthy than might be feared. It cannot be gainsaid that reality consists of both trees and forest--not to mention limbs and leaves, and finer detail.

Attention is now invited to a generalized-detailed picture of the manufacturing curve of Evansville. (1) The composite manufacturing-level curve of Manufactural Evansville, for 1859-1939 (based on Table 9, but not presented herein), paralleled that of the United States as a whole, largely because of the large diversity in Evansville manufactures, and her central location in the eastern part of our country. (2) It was slightly higher, in the main, than that of our country, which average was not high. But in some specific categories it was lower (Figs. 10-15). As of

TABLE 9
MANUFACTURING LEVEL 1849-1939^a

Year	Percentage Ratio of Value Added by Manufacture: Cost of Supplies		Evansville's Percentage of the U.S. Level ^b
	Evansville	United States	
1849.	..	84	...
1859.	88	83	106
1869.	98	70	140
1879.	63	58	109
1889.	86	81	106
1899.	89	73	122
1904.	79	74	107
1909.	81	69	117
1914.	71	67	106
1919.	59	66	89
1921.	..	71	...
1923.	..	74	...
1925.	85	75	116
1927.	85	78	109
1929.	85	82	104
1931.	106	89	119
1933.	104	86	121
1935.	89	70	127
1937.	43	71	61
1939.	86	77	112

^aThe leftmost two percentage columns were calculated from statistics in reports of the United States Census. The rightmost column was derived from the preceding two.

^bTo some extent for Evansville, her per cent of the level of the United States eliminates masking by price-fluctuations, in as far as she and the United States were affected alike by prices.

TABLE 10
MANUFACTURING PERFORMANCE 1859^a

Manufactural Groups, Categories	Wage Earners	Gross Production (\$1,000)	Local ^b Manu- facturing Level (%)	Local % of U.S. Level ^c
1. Food.	50	609	16	76
Flour and meal . .	45	596	15	79
Vinegar.	2	8	127	102
Coffee and spices.	1	1	100	400
Bread.	2	5	10	17
2. Metals and alloys .	282	420	184	140
Machinery, steam engines, etc. . .	152	273	461	274
Iron castings. . .	71	62	240	108
Agricultural implements. . . .	34	45	317	150
Bar iron	8	11	40	65
Edge tools	6	10	132	85
Blacksmithing. . .	5	7	250	137
Brass foundries. .	4	7	233	268
Plumbing and gas fitting	2	6	140	122
3. Wood.	261	296	226	188
Cooperage.	78	62	461	262
Furniture, cabinet sashes, doors, blinds.	62	51	325	152
Lumber, sawed. . .	27	53	194	137
Lumber, planed. . .	32	43	150	129
Lumber, planed. . .	4	14	300	122
Melodeons.	14	23	184	91
Carpentering. . . .	14	23	125	86
Carriages.	19	19	309	158
Shingles	4	5	400	255
Spokes, hubs, felloes	5	2	67	37
Wagons	2	2	290	142
4. Malt and liquor . .	47	102	89	131
Distilled liquor . .	5	12	26	57
Malt liquor.	39	46	84	74
Malt	3	44	129	313
5. Brick and stone . .	114	83	102	38
Cut stone.	44	38	70	34
Brick.	55	26	255	63
Pottery ware	15	20	600	163
6. Paper and printing.	49	46	476	418
Printing	47	43	516	381
Paper.	2	3	200	241

TABLE 10--Continued

Manufactural Groups, Categories	Wage Earners	Gross Production (\$1,000)	Local ^b Manu- facturing Level (%)	Local % of U.S. Level ^c
7. Tobacco, chewing and smoking. . . .	47	42	163	240
8. Leather and tex- tiles.	8	12	86	87
Saddlery and harness	3	6	90	78
Carded wool. . . .	1	4	64	173
Mattresses	4	2	145	104
9. Soap and candles. .	6	5	255	543
10. Miscellaneous . . .	53	110	...	...
All industries. . .	917	1,645	88	...

^aThese statistics concerning Manufactural Evansville were calculated from (1) Department of the Interior, Eighth Census of the United States, Manufactures of the United States in 1860 (Washington: Government Printing Office, 1865), p. 137; and (2) W. H. Chandler, Directory of the City of Evansville for 1859 (Evansville: W. H. Chandler, Printer, 1859).

^bManufactural Evansville.

^cIn the specific categories cited. The food group of the United States included many more items than the four herein cited. Evansville's manufacturing level of 16 in the four foods was 76 per cent of the level of the United States in the same four foods. In the total of the 36 categories listed (miscellaneous excluded), Evansville's manufacturing level was 119 per cent of the United States manufacturing level in the total for the same 36 categories.

TABLE 11
MANUFACTURING PERFORMANCE 1889^a

Manufactural Groups, Categories	Wage Earners	Gross Production (\$1,000)	Local ^b Manufac- turing Level %	Local % of U.S. Level ^c
1. Food.	346	2,377	13	59
Bread and other				
bakery.	72	151	102	132
Coffee and spices.	13	21	21	175
Flour and grist-				
mill.	166	1,841	15	84
Slaughtering and				
meat packing. . .	84	199	35	195
Sugar and molasses				
refining.	11	165	11	79
2. Wood.	1,115	3,228	80	88
Carriages and				
wagons.	138	216	116	93
Coffins.	6	21	48	40
Cooperage.	114	108	84	97
Furniture, cabinet				
and repairing. . .	21	19	79	61
Furniture, factory	656	790	126	86
Lumber, from logs				
or bolts.	243	1,543	60	75
Lumber, planing-				
mill products . .	37	531	81	108
3. Metals and alloys .	1,048	1,535	153	67
Agricultural				
implements. . . .	157	257	182	116
Foundry and machine				
shop products . .	662	940	228	77
Iron and steel,				
structural and				
ornamental. . . .	62	111	118	115
Tinsmith, copper-				
smith and sheet-				
iron work	73	129	184	155
Blacksmithing and				
wheelwrighting. .	31	39	255	94
Cutlery and edge				
tools	63	59	436	198
4. Leather and textiles	870	1,453	81	83
Carpets, rag . . .	3	2	225	166
Clothing, factory.	369	658	79	65
Custom made cloth-				
ing and dress-				
making.	259	239	160	160
Millinery, custom				
made.	51	82	53	55
Saddlery and har-				
ness.	239	472	60	51

TABLE 11--Continued

Manufactural Groups, Categories	Wage Earners	Gross Production (\$1,000)	Local ^b Manufacturing Level %	Local % of U.S. Level ^c
5. Stone and clay products.	426	452	124	40
Brick and tile. . .	155	74	701	128
Marble and stone work	37	54	79	49
Monuments	28	54	112	66
Masonry, brick and stone.	206	271	96	98
6. Printing and publishing.	223	251	325	108
Book and job . . .	50	60	198	91
Newspaper and periodical. . . .	173	191	377	163
7. Tobacco, chiefly cigars	173	191	181	115
8. Miscellaneous . . .	258	656	149	83
Liquor, malt. . . .	158	520	171	106
Brooms.	76	103	65	62
Mineral and soda water.	24	33	245	115
9. Others ^d	<u>2,508</u>	<u>1,945</u>	<u>112</u>	<u>...</u>
All industries	7,435	12,809	86	...

^aThese statistics concerning Manufactural Evansville were calculated from (1) Department of the Interior, Eleventh Census of the United States 1890, Manufacturing Industries (Washington: Government Printing Office, 1895), II, 215; and (2) Bureau of the Census, Manufactures 1905 (Washington: Government Printing Office, 1907), II, 278.

^bManufactural Evansville.

^cIn the specific categories cited. The food group of the United States included many more items than the five herein cited. Evansville's manufacturing level of 13 in the five foods was 59 per cent of the level of the United States in the same five foods. Her level in the total of the eight groups (33 categories) was 75 per cent of that of the United States in the same 33 categories.

^dThe item, others, included brass castings, cigar boxes, clay and pottery, chairs, cotton goods, organs, painting and paper hanging, plumbing and gas fitting, photography, tannery, trunks, also repairing of watches, clocks, and jewelry.

TABLE 12
MANUFACTURING PERFORMANCE 1904^a

Manufactural Groups, Categories	Wage Earners	Gross Production (\$1,000)	Local ^b Manufac- turing Level %	Local% of U.S. Level ^c
1. Food.	323	4,405	17	77
Bread and other bakery products .	103	354	55	75
Flour and grist mill.	102	2,639	11	73
Confectionery. . .	22	53	99	127
Slaughtering and meat-packing. . .	98	998	23	164
2. Wood	2,911	4,640	85	60
Carriages and wagons	945	806	53	36
Cooperage	72	213	94	159
Furniture.	1,198	655	138	105
Lumber and timber products.	467	1,230	89	41
Lumber, planing- mill products . .	229	737	44	60
3. Metals and alloys .	1,308	2,484	156	161
Agricultural im- plements.	179	403	133	103
Railroad car shops	945	1,118	127	120
Coopersmithing and sheet-iron working	65	106	130	121
Foundry and machine shop products . .	102	330	161	110
Stoves	317	527	285	142
4. Leather and textiles	164	325	60	74
Mattresses	14	28	69	86
Saddlery and har- ness	150	297	60	78
5. Stone and clay products	494	493	285	99
Brick and tile . . .	198	98	525	157
Monuments and cut stone	22	63	200	105
Pottery.	274	232	265	92
6. Tobacco	682	848	88	52
Cigars	668	828	86	52
Chewing and smoking	14	20	178	111
7. Printing and pub- lishing.	214	406	256	85
Book and job	93	148	185	97
Newspapers, peri- odicals	121	258	316	97

TABLE 12--Continued

Manufactural Groups, Categories	Wage Earners	Gross Production	Local ^b Manufacturing Level %	Local % of U.S.
8. Miscellaneous. . . .	397	520	80	38
Brooms.	330	340	55	60
Ice	34	84	460	163
Mineral and soda water.	22	41	149	74
Patent medicines. .	11	55	208	82
9. Others	2,103	5,440	108	...
All industries. .	8,596	19,201	79	...

^aThese statistics concerning Manufactural Evansville were calculated from Bureau of the Census, Manufactures 1905 (Washington: Government Printing Office, 1907), II, 278.

^bManufactural Evansville.

^cIn the specific categories cited. The food group of the United States included many more items than the four herein cited. Evansville's manufacturing level of 17 in the four foods was 77 per cent of the level of the United States in the same four foods. Evansville's manufacturing level in the first eight groups was 81 per cent of that of the United States, including the same categories in each group.

TABLE 13
MANUFACTURING PERFORMANCE 1914^a

Manufactural Groups, Categories	Wage Earners	Gross Production (\$1,000)	Local ^b Manufac- turing Level %	Local % of U.S. Level ^c
1. Foods.	318	4,051	21	95
Bread and other				
bakery	126	452	73	114
Confectionery . .	27	86	54	78
Flour and grist .	165	3,513	15	88
2. Wood	3,338	7,651	88	74
Cooperage	36	60	93	182
Furniture	1,806	3,375	72	55
Lumber, timber, and planing-mill	486	1,716	50	42
Carriages and wagons	1,000	2,500	49	49
3. Metals and alloys.	1,259	2,595	130	92
Agricultural implements . . .	240	716	168	137
Foundry, machine shop products. .	721	1,301	88	62
Stoves and ranges	298	578	247	135
4. Leather products .	152	321	68	103
5. Printing and pub- lishing, book and job	261	738	242	95
6. Tobacco, chiefly cigars.	1,869	2,433	121	88
7. Miscellaneous. . .	147	475	133	76
Ice	97	216	323	136
Mineral and soda water.	35	186	58	50
Patent medicines.	15	73	108	52
8. Others	2,989	13,903	114	...
All industries. .	10,333	31,427	71	...

^aThese statistics concerning Manufacturing Evansville were calculated from Bureau of the Census, Census of Manufactures, 1914 (Washington: Government Printing Office, 1918), I, 395; and II, 908.

^bManufacturing Evansville.

^cIn the specific categories cited. The food group of the United States included many more items than the three categories herein cited. Evansville's manufacturing level of 21 in the three foods was 95 per cent of the level of the United States in the same three categories. Evansville's level in the first seven groups (16 categories) was 48 per cent of that of the United States, including the same categories in each group.

TABLE 14
MANUFACTURING PERFORMANCE 1929^a

Manufactural Groups, Categories	Wage Earners	Gross Production (\$1,000)	Local ^b Manufac- turing Level %	Local % of U.S. Level ^c
1. Food.	492	9,241	27	55
Bread and other bakery products .	275	1,757	107	100
Butter	52	1,892	12	70
Coffee and spices.	13	340	29	104
Confectionery. . .	28	129	99	119
Flour and grist. .	124	5,123	16	73
2. Wood.	2,721	9,923	123	115
Furniture.	2,267	9,469	125	102
Planing mill pro- ducts	77	454	91	93
3. Metals and alloys .	379	2,013	100	94
Electroplating . .	15	44	671	170
Plumbers supplies.	158	602	89	55
Stoves and ranges.	204	1,367	99	59
4. Tobacco, chiefly cigars	2,457	6,637	122	61
5. Stone products. . .	46	1,049	253	121
Marble, granite, cut stone	33	257	271	112
Concrete products.	13	62	195	112
6. Printing, and pub- lishing, book and job.	137	730	205	74
7. Miscellaneous . . .	163	1,306	161	70
Ice.	76	326	472	111
Mirrors.	56	381	94	91
Patent medicines .	7	85	111	49
Beverages.	24	414	144	95
8. Other industries. .	8,028	6,121	86	...
All industries . .	13,981	90,866	85	...

^aThese statistics concerning Manufacturing Evansville were calculated from (1) Bureau of the Census, Fifteenth Census of the United States, Manufactures; 1929. State Series, Indiana (Washington: Government Printing Office, 1933), p. 13; and (2) Manufactures; 1929 (Washington: Government Printing Office, 1933), II, 20.

^bManufactural Evansville.

^cIn the specific categories cited. The food group of the United States included many more items than the five herein cited. Evansville's manufacturing level of 27 in the five foods was 55 per cent of the level of the U.S. in the same five foods. Evansville's level in the first seven groups was 82 per cent of that of the U.S., including the same categories in each group.

TABLE 15

MANUFACTURING PERFORMANCE 1939^a

Manufactural Groups, Categories ^c	Number of Establishments ^b	Evansville Manufacturing		
		Number of Wage Earners	Gross Production (\$1,000)	Level, Per Cent
1. Food and kindred products.	...	1,722 ^c	29,541	108
Bread and other bakery.	...	260	1,272	100
Candy and other confectioneries. . . .	2	25	120	105
Condensed and evaporated milk. . . .	1	...	...	...
Creamery butter.	3	65	1,541	013
Beverages, non-alcoholic.	4	62	1,092	153
Flour and other grain-mill products. .	5	193	...	...
Ice cream.	4	23	223	75
Malt liquor.	3	628	...	...
Meat-packing, wholesale.	3	391	...	...
Pharmaceutical or health foods. . . .	1d	200+	1,000+	100+
2. Apparel and other finished products from fabrics, etc.	4	271	918	84
Canvas (not bags).	2	...	...	...
Work clothing, n.e.c.	1	...	...	...
House dresses, uniforms, aprons. . . .	1	...	...	...
3. Furniture and finished lumber products	16	577 ^c	2,395 ^c	69
Furniture.	11	1,214 ^c	3,783 ^c	103
Coffins, burial cases.	2	...	...	...
Baskets for fruit, etc.	1	...	...	...
Cigar boxes.	2	...	...	...
Cooperage.	2	...	...	...
Wooden boxes (not cigar).	1	...	...	...
Planing-mill products.	6	47	270	152
4. Chemicals and allied products. . . .	6	53	490	62
Paints, varnishes, and lacquers. . . .	3	45	...	...
Fertilizer.	1	...	...	...

TABLE 15--Continued

Manufactural Groups, Categories ^c	Number of Establishments ^b	Evansville Manufacturing			
		Number of Wage Earners	Gross Production (\$1,000)	Level, Per Cent	
5. Stone, clay and glass products . Concrete products Mirrors Marble, granite, slate, cut and shaped	9	272	588	158	...
		50	.....		...
		...			...
		20	104		285
6. Iron and steel, and their products, except machinery Edge tools. Plumbing supplies, iron sanitary ware, except China Fabricated structural and ornamental work, not of rolling mills. Gray-iron semi-steel castings Hardware n.e.c. Power-boilers and associated products Stamped and pressed products, not automobile Stoves and ranges, not electric Tools n.e.c.	16	911	4,606	103	...
		...			...
		47	613		88
		190	.....		...
		...			...
		...			...
		...			...
		162	.....		...
		...			...
		...			...
7. Non-ferrous metals and their products. Electroplating. Aluminum products n.e.c. Brass foundry Sheet metal Such products n.e.c.	7	626	.....	...	284
		22	111		...
		...			...
		...			...
		...			...
		...			...

TABLE 15--Continued

Manufactural Groups, Categories ^c	Number of Establishments ^b	Evansville Manufacturing			
		Number of Wage Earners	Gross Production (\$1,000)	Level, Per Cent	
8. Sawmills, veneer mills.	2	....	....	...	
9. Machinery, except electrical. . . .	9	4,369	....	...	
Agricultural.	2	...	....	...	
Excavating.	1	...	....	...	
Machine-shop repairs.	1	...	....	...	
Metal-working machinery and accessories.	2	...	....	...	
Pumps.	1	...	....	...	
Refrigerators and refrigerating equipment.	2	...	....	...	
10. Automobiles and automobile equipment, bodies, parts.	3	1,566	....	...	
11. Printing and publishing,	16	....	....	...	151
Book and job.	13	128	759	...	...
Newspapers.	2	...	....	...	...
Engraving, etc.	1	...	....	...	...
12. Paper and allied products.	3	....	....	...	...
Paper.	1	...	....	...	...
Containers and boxes.	2	...	....	...	...
13. Rubber products.	1	....	....	...	...
14. Leather products.	2	....	....	...	...
Saddlery, harness.	1	...	....	...	...
Other.	1	...	....	...	...
15. Cigars (1937)	4	1,221	3,579	109	

TABLE 15--Continued

Manufactural Groups, Categories ^c	Number of Establishments ^b	Evansville Manufacturing		
		Number of Wage Earners	Gross Production (\$1,000)	Level, Per Cent
16. Miscellaneous. . . . .	..	.....	.....	...
Ice	4	38	207	306
Brooms.	2	..	....	...
Signs, advertising novelties. . .	2	..	....	...
Fabricated plastics	1	..	....	...
17. All industries (1939)	186	13,371	129,779	086

^aSources: Calculations based on, and data from, Bureau of the Census, Sixteenth Census of the United States, Manufactures 1939 (Washington: Government Printing Office, 1942), III, 304 and 312.

^bSome establishments had more than one factory.

^cStatistics for the groups are for 1939; those for the categories are chiefly for 1939, but a few are for 1937. The total for the group is not the total of its categories cited. Blanks represent information unavailable.

^dMore than a million gross production; higher than 100 in manufacturing level.

1859, Evansville's manufacturing level in the total of 36 categories was 119 per cent of the United States manufacturing-level in the total of the same 36 categories. As of 1889, in like manner, her comparative level in the total of 33 categories was only 75 per cent; for 1904, in 27 categories, 81 per cent; for 1914, in 16 categories, 48 per cent; and for 1929, in 18 categories, 82 per cent. (3) It was a bit lower, in 1929, than that of the average for cities of Evansville's class. (4) It was relatively high in the middle of the nineteenth century, and net-declined considerably to the time just prior to World War I, and subsequently net-rose somewhat.

Statistics prior to 1859, for calculations for Evansville, are not both available and satisfactory.¹ However, it is considerably opined, from available, if fragmentary, evidence, that Manufacturing Evansville's curve for the period, 1840-60, was in keeping with her masked parabolical-curve as a whole.

In general, her entire curve was strong; gave evidence of aperiodic rejuvenation, and a few pronounced depressions; and was net-strengthening in the period, 1919-39. It appears that her curve is destined to be overall a long, and, therefore, flattened one.²

The generalized-detailed presentation of the manufacturing curve of Evansville turns now to consideration of the manufacturing-level curve for each of twenty-six categories, for the period throughout 1859-1939, based upon Tables 10-15. These curves (not reproduced herein) reveal cross-sections of her manufacturing performance, and thus present a picture in gross detail.³ Inter-

¹Indeed, Census statistics for the period, 1850-80, are not wholly satisfactory for such calculations, because of somewhat loose returns in manufacturing detail; but they are useful, and better than none.

²In his research work, Walter S. Tower has emphasized the role of considered prediction. J. Paul Goode excelled in what might be termed intuitive prediction. In recent publications, Robert S. Platt and Charles C. Colby have ventured predictions, each in his own way. A. C. Trowbridge, in geology, has emphasized prediction based upon study of the evolutionary curve.

³Henry M. Leppard has emphasized minute detail, reassembled in gross detail.

pretative comments follow: (1) A large majority of the twenty-six categories net-trend from an early high manufacturing-level to a recent lower level, with a nadir hovering about the dawn of (chiefly after) the twentieth century. Example: Factory-made furniture net-trended from a level of 300 in 1859 to one of 102 in 1939, with a nadir of 73 in 1914. (2) The rejuvenation of old industries, the mutation of others, the aperiodic appearance of new industries with high levels, and the death of certain industries with low levels, all tended to rejuvenate the composite curve of our Manufactural Component. Examples: Rejuvenation of monuments and cut stone, also bakery products, and soft drinks; mutation of refrigerators; introduction of electroplating and "health" foods; and the demise of carriages and wagons. Probably the most striking period marking the introduction of new industries with high manufacturing levels was the period, 1915-46. (3) Some industries, like ice and bricks, have maintained a very high level (low cost of fuel and materials; high cost of conveyance by potential competitors). (4) Some industries, like flour, meat-packing, butter, and the processing of coffee and spices, have maintained a standardized level very low. (5) Some industries, like carriages and wagons, and some phases of both cigars and furniture, exhibit a marked drop in manufacturing level (not quality) coincidental with quantity-production for special customers (such as mail-order houses, and chain stores).

Table 16, presenting the evolution of twenty-seven selected categories of Manufactural Evansville, is, in effect, a summarizing bit of panoramic generalized-detail, covering more than a century. The birth and climax of each category is given, and demises are recorded. The categories are grouped according to their general manufacturing levels, by classification into three groups. In group 1 (low level) are three categories; in group 2 (medium level), ten categories; and in group 3 (high level) fourteen categories. Comments on the careers of the categories occur in the legend.

Evolutionary Stages

Youth.--Manufactural Evansville, in her evolutionary stage of early youth, utilized supplies (at that time, chiefly materials and fuels) secured in large measure in her proximity. Most were

TABLE 16
EVOLUTION OF SELECTED CATEGORIES^a

Category	Birth	Climax		Demise or Obscur- ity	Manu- factur- ing Level ^b
		Year	Gross Products \$1,000		
1. Slaughtering and meat- packing.	1840-45	1919	2,000+		1
2. Processed produce . . .	1860	1932	1,000+		1
3. Grain-mills, especially flour.	1814	1919	10,515		1
4. Bread and other bakery products	1850-60	1929	1,757		2
5. Textiles.	1861	1929			2
6. Carriages and wagons. .	1830-35	1914	2,000+	1927	2
7. Brooms.	1859	1929	500		2
8. Wood containers	1840-50	1929	480		2
9. Saw-mills	1820	1890	1,600		2
10. Wood-planing, and finished parts	1830	1890	536		2
11. Automobile bodies, and parts.	1912	1929	1,000+		2
12. Leather and its products	1830-35	1889	500	1932	2
13. Clothing.	1835-40	1932	1,000+		2
14. Brewing	1837	1914- 18	1,000+		3
15. Cigars, chiefly	1835-39	1923	7,500		3
16. Stoves.	1840-50	1923	1,682		3
17. Products from canvass .	1860	1929	500		3
18. Brick and tile.	1820-30	1929	300+		3
19. Stoneware and pottery, including porcelains .	1849	1929	500+		3
20. Vitrified (bathroom) ware	1900-09	1929	500		3
21. Furniture	1830-35	1925	11,000		3
22. Edge tools.	1851	1929	300+		3
23. Refrigerators	1921	1933	1,000+		3
24. Foundry and machine- shop products.	1830-35	1919	6,200		3
25. Agricultural implements and machinery.	1840-50	1919	1,521		3
26. Architectural, con- structional, and orna- mental irons, steels .	1840-45	1929	2,000		3
27. Patent medicines, pharmaceutical foods, and allied products. .	1867	1933	1,000+		3

^aBased upon an unpublished study of the evolution of the categories.

^bThe manufacturing-level groups used herein are: 1 (low, 10-50 per cent); 2 (medium, 51-100 per cent); 3 (high, above 100 per cent). These are percentages, not percentiles. The manufacturing level of 100 is, in fact, not very high.

Footnotes continued

In some instances the gross production is masked in order not to disclose performance of an individual establishment.

Remarks concerning specific categories: No. 1 (slaughtering and meat-packing), much more than 2,000 No. 4, level: 1 in early days; 3 in 1929. No. 5, wool out in 1912. No. 6, level: 3 in early days; 2 by 1899; 1 in 1919; mutated to automobile bodies. No. 7, level: 3 in early days. No. 8, level: 3 in early days. No. 9, level, 3 in early days. No. 10, level: 3 in early days, and subsequently 3 aperiodically. No. 11, some 3,000 wage earners in 1929. No. 12, level: 3 in tanning, saddlery, trunks. No. 13, level: 3 infrequently. No. 14, level: 2 in early days; gross production more than 1,000. No. 15, snuff out in 1870. No. 16, drastic decline in the 1930's; level: 2 in the 1930's. No. 17, evolved from steamboat-supplies. No. 18, gross production considerably more than 300. No. 19, stoneware out in the late 1920's. No. 20, inoperative in 1933. No. 21, level: declined to 2 in 1930's. No. 23, evolved from ice-boxes and machinery. No. 27, "health-food" phase began in 1916.

indigenous locally; some were available at Evansville by virtue of its wholesale trade. The Component used, to a less extent, materials from afar in order to manufacture, mainly for local needs, products not otherwise readily available. She placed her manufacturing emphasis upon materials (rather than products). In part, also, she stressed quantity-production, as, for example, in processing hides, and in "curing" and "packing" meat, all chiefly for the wholesale trade.

In an early stage in her youth, Manufactural Evansville developed a non-youthful trait (which was also a complicating trait) in that she bought materials from afar, e.g., iron¹ from Pittsburgh, manufactured it, and sold many of the products afar, mainly down the Ohio and Mississippi rivers--as, for example, ornamental, architectural, and structural irons, which her local market and the South, with its specialized economy, needed. These and other irons were processed in blacksmith and whitesmith (tin) shops, and foundries. Later they gradually mothered an array of iron, steel, and allied or related products, especially agricultural implements and machinery for Southern plantation, and equipment for steamboats. In this trait she patterned, in moderate measure, after manufactures moving in the wholesale trade at Evansville, as, for example, at a later date, factory-made furniture from Cincinnati. Her shipments

¹Even earlier a wholesale-retail business in iron had developed at Evansville, which continued into the twentieth century.

of these "copied" manufactures she marketed mainly in destination-land which had been opened previously by Evansville wholesaling.

Outstanding among the manufactural lines which the wholesale trade aided or abetted were irons, woods, foods (especially flour), tobaccos, leathers, and textiles (wool and, later, cotton).

In these, and other ways, the youthful Manufactural Component grew in diversity and complexity. It is restated that out of divers circumstances she developed an early-youthful manufacturing level¹ somewhat above that of the average of the United States, which was not high. Owing to her diversity, the fluctuations of Evansville's level paralleled roughly that of our country (Table 9).

In more advanced stages of her youth, Evansville's composite manufacturing-level was buoyed by inventions,² expanding and new

¹The level was a resultant of positive and negative "forces." Among them were the following: Supplies were proximal and also at hand in the wholesaling; therefore they were abundant and low-priced (truly cheap). Other pursuits, in a growing, young city, competed for labor, which increased the manufactural wage and tended to lower the manufacturing level. The products in the main were manufacturingly simple; but some (such as cabinet work, and irons) involved considerable skill and labor; result: higher level. Competition within the Tri-State Area, from without that area, was relatively small, and it encountered conveyance difficulties. The firms were relatively young, and they were launched not without high expectations and potentialities; moreover, the weak and unfortunate ones disappeared.

Table 9 reveals an unusually sharp peak, as of 1869, in the level of Evansville. It reveals also an unusually sharp depression as of 1919. These fluctuations were, in large measure, due to variance in the output of certain products. The manufacturing level of flour is very low. In 1859 the gross production of flour was \$596,000 in dollar volume; but it dropped to \$362,000 in 1869; due, in part, to diversion in the flow of wheat eastward from the northern Midwest as railroads developed. Therefore the manufacturing level of Evansville rose. By 1879 the production of Evansville flour had recovered (\$1,625,365). World War I caused a rise in the output of flour from \$3,725,000 in 1914 to \$10,515,000 in 1919 (resultant lowering of the Evansville level); moreover, the prohibition law suspended at Evansville the production of millions of dollars worth of beer, with its high level (resultant lowering of the Evansville manufacturing level).

²As, for example, the local invention of a new form of plow, which was the basis of the first Evansville factory to produce agricultural implements and machinery vigorously. Another local invention was that of bottle caps (for liquor), out of which grew another factory.

categories with relatively high levels,¹ (Table 16), active utilization of proximity coal, and the Civil War,² also new conveyance³ and freight-rate advantages.⁴ Her really cheap coal (indigenous) lowered the item, cost of supplies, and thereby potentially raised the manufacturing level. Among the expanding categories were those of saw-milling (hardwood and others) and mill-planing (including finished parts, such as sash and doors), both of which in early days had a high⁵ level, owing to nearness of supplies, and river transportation. The climax came about 1890, when, by estimate, a total of 107,000,000 feet, B.M., of lumber were sawed at Evansville.

Maturity.--Manufactural Evansville had passed into a stage of maturity when she had begun to buy habitually from afar a number of her basic materials of which she used much (e.g., wood, iron, steel, tobacco, cotton, leather and sugar). Some of her erstwhile local materials had receded (wood, hides, and fur); some no longer sufficed (wheat, hard-wood); some did not exist locally (steel, iron, leaf tobacco for cigars, cotton, and sugar). Perhaps the sawing and planing industries, being basic to the wood Group, which then led, serve best as an indicator of the transition from youth to maturity. By 1909, these two industries, though still weighty in status, had declined to one-half of the dollar volume of that of 1889, and their manufacturing level had also declined (in part due to increased distance from resource-

¹Among them were the following: Machinery for steamboats, and for refining of plantation products; pottery; factory-made furniture; cigars; elevators; tanning, saddlery, and trunks.

²In the early period of the Civil War, Evansville's manufacturing output was curtailed. But in the later period it was stimulated by the war-needs of the North (e.g., textiles, clothing, and hardware), and, later, by the needs of the South, behind the Union lines, as Southern territory was gradually occupied and pacified by the armies advancing into the South.

³Steamboat and railroad, and, to a small extent, canal.

⁴Her Ohio River gateway freight-rate advantages.

⁵Saw-milling: 150 in 1859; 96 in 1869. Mill-planing: 250 in 1859; 190 in 1869; and 132 in 1889.

land).¹ The first one and one-half decades of the nineteenth century marked the transition to the stage of maturity, or, perhaps, the period, 1895-1910.

Net-progressively, in maturity, she reached out to buy concernedly as nearly and as advantageously as possible. By the early nineteen-thirties, her total purchases of basic materials had become anchored more distant than her total sale of products (Chapter V) although her manufactural sales-pattern extended beyond that of her purchases pattern of materials (fuel had remained proximal). Net-progressively, also, she was striving to extend her sales even more afar, the while she retained sales in her heart-land of Neighborhood States. She strove to extend; she strove to limit. Incidentally, in line with these circumstances, her land use pattern exhibited discernible locality segregation of such of her factories as sold locally (inner factory-locations in the city) from such as sold afar (outer factory-locations in the city), as is portrayed in Chapter IV.

In her maturity, emphasis on quantity-production became more pronounced, although it had appeared, in smaller measure, in youth. Quantity-production was not ubiquitous, for many establishments avoided it; but some firms found it profitable to assume large contracts based upon a rather low manufactural profit per unit produced. Examples were some phases of: furniture, cigars, automobile bodies and parts, farm engines, carriages and wagons, clothing, ice boxes, radio cabinets, boxes and crates, veneers, and brooms. Stoves and harness gear were also sold at relatively low prices in the South. These operations pivoted, in part, upon low cost of coal, advantageous labor, abundance of some materials relatively low cost of selling (contract, jobbing, commissions), ease of movement of intra-city freight, and the relatively low cost of living at Evansville. Some establishments, like Montgomery Ward, and also Sears, Roebuck and Company, became financially interested in a few of the Evansville plants. In some aspects of

¹Much later, the level in saw-milling recovered somewhat; but that was due to improved technology in the manufacturing of veneer. Also, much later, the level in mill-planing rose strongly (following a net-decline to about 50 in 1904); but the rise was due, in part, to the production of higher-class goods, and innovation toward the production of parts for buildings.

the automobile business there were financial relations between Evansville and Detroit. In effect, Manufactural Evansville, in relatively small overall measure, became "satellitic" to Chicago and Detroit, in a non-derogatory sense. In addition, flour and meat-packing, two great industries of Evansville, operated, as is true throughout our country, on a low margin of manufactural increment.

Now the circumstances portrayed in the preceding paragraph, plus other circumstances, such as increased distance to materials, and fierce competition, especially in the South,¹ where, in addition, there was longtime depression, tended to lower the composite manufacturing-level of Evansville, whilst other circumstances tended to raise it. It is not surprising, therefore, that in 1929, the manufacturing level of the 73 cities of the class of Evansville exhibited a composite of 110 per cent, whereas that of Evansville was 85 per cent. Among the 74 cities, Evansville ranked fortieth. Some 67 per cent of the leading (60) competitor cities (Fig. 37) of Evansville surpassed her level of manufacturing. Likewise, some 76 per cent of the leading (45) Northern competitor cities of Evansville surpassed her; but only some 33 per cent of her leading (15) Southern competitor cities achieved that status.

What Manufactural Evansville needed in order to stave off old age was, among other things, an increase in manufacturing level (increased emphasis upon products, relatively less dependence upon materials), through internal changes and additional industries. She was moving in that direction during the period, 1915-40, as

¹E.g., in stoves and furniture.

See Bureau of the Census, Fifteenth Census of the United States 1930, Manufactures: 1929, III (Washington: Government Printing Office, 1933), 14.

It is stated that, during the decade 1919-29, the highest rates of increase in manufacturing were those for the five Southern States: South Carolina, Tennessee, North Carolina, Georgia, and Texas.

Something of the effect upon Manufactural Evansville is revealed by citation of the rise of manufactures in those states. The major part of the above manufactural gains of the five states was inherent in the following: cotton goods, knit goods, lumber, and furniture, in the Carolinas; cotton goods, knit goods, rayon, and motor-vehicle bodies and parts, in Tennessee; cotton goods, knit goods, and turpentine and rosin, in Georgia; petroleum, foundry and machine-shop products, bakery goods, and cotton goods, in Texas.

seen through the masking screen of World War I, Great Boom I, Great Depression I, and World War II. It was being accomplished through: (1) the help of her industries such as refrigerators, electroplating, hosiery, printing and publishing, "health" food for infants; (2) the rise of revamped industries, such as beer, non-alcoholic beverages, bakery products, some stoves, monuments and cut stone, and clothing; (3) the demise of sick industries; as well as (4) the overall ascendancy of metals and alloys. She was being basically strengthened by her revamped meat-packing, and produce-packing. All of this was coincident, and partly related to, the influx of new capital, enterprise, and management, the resiliency of her "home talent," and a shift toward Northern markets.¹ What Evansville needed, further, to remain vigourously mature, was more of the same kind of thing.²

The general trend of Manufactural Evansville, described in the preceding paragraph, augurs favorably towards her future.

Historical Periods

Following are the main periods in the historical geography of Manufactural Evansville:

Incipient Manufactural Evansville germinated during the period 1818-29, while Village Evansville was haltingly taking root.

The Infant Component, 1830-44, plodded slowly forward, while Town Evansville spurted, and then slowed in depression.

The Adolescent Component, 1845-64, found itself, while City Evansville struck its stride.

Multitudinous Manufactural Evansville, 1865-1913, branched most diversely, while river-rail Gateway Evansville waxed sturdily.

Tidal Manufactural Evansville, 1914-33, flooded and ebbed violently, net-forward, while Heaving Evansville inflated and deflated, with net advance, during the period of World War I, Great Boom I, Great Depression I.

¹Accordingly those markets need to be studied with great care.

²Besides her potentialities for air-conditioned housing, cited heretofore, the possibilities of machine-tools, precision-tools, and precision machine-tools are suggested. The manufacturing levels are very high. Evansville has had long experience in divers manufactures, divers machines and tools. She has labor potential in technological training. She is centrally located.

Section 3. Beginnings

It has been stated that Manufactural Evansville is rooted deeply in the past. Here are treated selected aspects of early Evansville which have been germane to Manufactural Evansville.

Comment

Evansville and her Manufactural Component have exhibited a high degree of individuality, largely due to her setting and her people. Precisely the same combination scarcely could occur again. If Evansville were to be refounded today by the same people, upon the same site primitive, with the remainder of her setting as of today, Evansville II would not duplicate Evansville I. (1) Because of the great changes in the flow of trade, her relations with the South would be less close. (2) She would not be aided as greatly, and in the same manner, by Evansville's wholesale trade. (3) Because manufacturing has moved into factories, and made great strides toward standardization (aperiodically interrupted by innovations and new technologies), Manufactural Evansville II would not, as The First as a component of Manufactural United States, experience early development under manufacturally-pioneering conditions. Component I "found herself" at about the time that factory-made products were becoming emergent in the United States --a particularly striking time and circumstance in which to "grow up." (4) Evansville II would not, as is Evansville I, be a sister-city among Ohio River terrace-sited, gateway-cities, such as Louisville and Cincinnati, with a good deal in common, in inherited traits.¹

Village Beginnings

Site, primitive routes of travel in the Wabash minor-corridor and thence across the Ohio River, politics, salt--all four played a role in Evansville's beginnings.

¹Of course the three cities differ also. Louisville, with no Northern corridor comparable to that of the Wabash, is the most southern of the three. Cincinnati, for obvious reasons, is the most Eastern. Evansville was the most pocketed, and, therefore, the most homogeneous. Her really cheap coal has provided her with the greatest urge, among the three, toward manufactural emphasis upon materials.

Village Evansville birthed and rooted slowly. It was abortively platted in 1814 by a Kentuckian-Indianian pioneer (who perhaps spelled his name Hugh McGary, the first permanent white settler on the site of Evansville) who bought the land of the United States, wishfully-expecting it to become county seat of Warrick County (formed 1813). But the county was subdivided, and still-born Evansville's political aspiration was frustrated, partly because her position in the newly-delimited Warrick County was too marginal.

McGary tried again, successfully. Evansville was replatted in 1817 (Fig. 17), as the ear-marked county seat of Vanderburgh (now Vanderburg) County, carved out of Warrick County, partly to further the future of Evansville, a transaction promoted chiefly by McGary and influential Virginian-Kentuckian-Indianian Robert Evans, who, partly to lengthen the shadow of his name, had bought advantageously a large parcel of the replatted land, which parcel is now a part of the heart of Evansville. The planned countyseat-ship materialized, in some measure, through financial and lot-inducements. The settlement was incorporated as a village in 1819; it was chartered in 1847; and it annexed Lamasco in 1857.

The village had some advantages. It had a largely-smooth terrace site (described in Chapter II), on an outer, hairpin-bend of the Ohio River, where the water was deep, less swift than adjoining upstream and downstream, relatively free from ice, and where the terrace-border was least subject to flood. The site was (1) near an Indian village, and (2) boat-crossing, subsequently a pioneersman ferry (Sweezer's Ferry), at the mouth of Pigeon Creek, and (3) near the Indian Red Bank Trail, which led from Indian villages above Terre Haute, southward, and thence to Red Bank (near Henderson, Kentucky), and thence, finally, southward to Indian villages in Kentucky. The Evansville land, near the trail, was relatively high, and sometimes was occupied by the Indians. The site had salt, highly important. The old salt-well is in a sort of park, near Pigeon Creek, as of today.

Conveyance-Way Patterns

The major street pattern of Evansville grew out of early conditions and circumstances. The streets of the early settlements were laid out roughly in alignment with the general course of the

Ohio River. Thus the streets of Lamasco and Independence (Figs. 1 and 17) trend cardinally; but those of early Evansville do not. Subsequently, owing to the general near-levelness of the terrace, most of the newer streets were laid out north-south. The elbow-course of Pigeon Creek necessitated early bridgmen for conveyance (1) among the triple centers of the town (Evansville, Lamasco, and Independence), and (2) between Evansville and towns beyond. Thus, in the thirties-forties four bridges across Pigeon Creek were utilized: Water Street (at the mouth of the Creek, now Riverside Drive); Franklin Street and Maryland Street (to Independence); and the Princeton, or Stringtown Road, leading north to that settlement. Other significant roads led as follows: west, to Mt. Vernon; northwest, to New Harmony; northeast, to Booneville; and east, to Rockport. These routes, some of them entering the city diagonally to become "radial" streets, influenced greatly the land use pattern of Evansville, as it grew and expanded areally. The patterns of these streets are still, in large measure, extant.

The railroad pattern in Evansville has influenced greatly the city's land use pattern, especially, as is disclosed in Chapter IV, the manufactural land use pattern. The distribution of the railroads is related to the Central Business District and to the tongues of valley land in the bluffs by which the railroads approach the city from the north and west (Fig. 21). The railroad companies secured, for their depots, locations near the Central Business District (Figs. 1 and 15), and laid their tracks, as directly as was feasible, to connect the valley tongues and the depots. The pattern was interknit by the construction of the two interconnecting lines, i.e., the belt lines. Recently the depot pattern has been made more centralized.

Naturally the early land use pattern of Evansville aligned chiefly with the pattern of the river and the creek. Later, the alignment was chiefly with the railroad pattern. Land use adjustment to the Wabash and Erie Canal in Evansville (Fig. 30) are discernible, but not great. However, in addition to alignment with conveyance ways, the land use pattern of Manufactural Evansville is affected by other factors, as is disclosed in Chapter IV.

Wholesale Trade

Because of its importance to early Manufactural Evansville,

the wholesale trade of the Commercial Component of Evansville merits attention.

It had wholesale-retail concerns in the forties; but it launched its exclusively wholesale firms in the early fifties, and soon ventured into the commission business. Her exports via river and canal routes amounted to an estimated total of \$6,000,000 in 1857; it was larger in 1867, despite the curtailment imposed by early phases of the Civil War. As early as 1870 Commercial Evansville had as many as 150 wholesale establishments. In 1874 some 49 Tri-State counties traded with Evansville, and manufactured very little. Her wholesaling attained fives of millions of dollar-volume in 1875, and some tens of millions in 1910. Early in the nineteen-hundreds she decreased somewhat in her role of "mothering" Manufactural Evansville, which had grown larger and more independent. Shortly thereafter she reoriented, and subsequently sold predominantly in the North. This reorientation was related, in part, to the fact that, in the twenties she experienced curtailment of her river-rail gateway-advantages, with some compensatory changes, especially in rail-freight rates, in the North. She encountered stiffened commercial competition from large commercial centers, such as Indianapolis and Chicago, coincident with the development of financial consolidations, changes in methods, improved conveyance and conveyance-ways, and the inroads of chain stores. Therefore her Tri-State wholesale area contracted. Her net wholesale trade in 1929 was about 60,000,000,000, which trade bulked less in dollar volume than did the sales of Manufactural Evansville.

Beginnings in wholesaling.--In the thirties-forties Commercial Evansville was flatboating local and Northern products down the Ohio, and, thence, to Lower Mississippi River centers. She was business-hostess to flatboat-men returning northward, especially to those headed for the Wabash River, and Green River valleys, which men made Evansville their objective, because of her proximity to those valleys. Enroute home, these men purchased supplies at Evansville, for consumption at home. This business initiated Evansville's role as a redistributing center. She patronized stage lines to New Harmony; Mount Vernon; Boonville and Louisville; Vincennes, Terre Haute, Lafayette, and Danville--in matters of mail and merchandise.

Mid-Century wholesaling.--Mid-Century Commercial Evansville

exported and imported vigorously, chiefly in steamboat-conveyed trade. She profited by upstream as well as downstream traffic (Tables 17 and 18), and was the chief trade center between Louisville and Cairo. She intercoursed, not only with centers on the Ohio-Mississippi River, but also with many centers located far upstream on tributaries in the North and South (Tables 19 and 20, also Appendix I). Moreover she traded abroad (became a port of entry in 1856).

She bought largely in the Tri-State Area, plus considerable from the South, and less from the Northeast (Appendix I). She sold very largely in the Tri-State Area and the South, with large shipments North, and minor ones Northeast.

Commercial Evansville had favorable trade relations with the South, especially New Orleans. That city imported, for redistribution at and from Evansville, groceries (especially sugar, salt, and coffee) and other items. Later the South sent cotton, for use and for reshipment at Evansville. The South, specializing on cotton and corn, purchased in the North (including Evansville) vast quantities of food, clothing, agricultural implements, mills, stoves, bagging, and other manufactures. Evansville became a rendezvous for river-tradesmen.

Later wholesaling.--Rail-river gateway Commercial Evansville flourished for decades, depending for conveyance chiefly upon railroads, with freight-rate advantages, although river traffic increased until about 1876, and then declined slowly; for packet service lingered at Evansville till about 1930 (Appendix I). Her net-wholesale topped \$60,000,000 in 1929 (Table 21). As described in Chapter II, Evansville became something of a commercial node, rather early. She developed a distinct wholesale district in Evansville, centering on First Street, between Vine and Sycamore (Fig. 2). This nodular function stimulated commodity-variety in the Commercial Component's trade, and helped to diversify the structure of the Manufactual Component's production.

The Civil War, and the concomitant advent of vigorous railroading, modified Evansville's wholesaling somewhat. She suffered severe curtailment in her redistributive sales of hay to the South: in packed-hogs to the South (many Tri-State hogs were packed in Cincinnati, after the dual event, for the eastern market); and in groceries (from New Orleans) to the Tri-State and northward. But

TABLE 17
WHOLESALE 1857^a

Commodity	Quantity	Chief Destinations	Chief Sources
Produce shipped			
Corn, bushels.	228,186	Lower Miss. River	Tri-State
Wheat.	52,699	Lower Miss. River	Tri-State
Oats	59,310	Lower Miss. River	Tri-State
Barley . . . . .	.....	Lower Miss. River	Tri-State
Flour, barrels	62,228	Lower Miss. River	Evansville
Corn meal. . . . .	.....	Lower Miss. River	Evansville
Whiskey.	6,397	South	Evansville
Tobacco, hogsheads	9,781	Northeast	Tri-State
Hay, bales	2,415	Lower Miss. River	Tri-State
Cotton . . . . .	.....	.....	.....
Provisions shipped			
Pork, barrels.	4,052	Lower Miss. River	Tri-State
Salt	58,814	North	New Orleans
Wholesale sales, dollars			
Drygoods (plus retail in this item only)	845,271	Tri-State, North	Northeast, New Orleans
Groceries.	Large	Tri-State	New Orleans
Boots and shoes.	100,000	Tri-State	Northeast, Evansville
Leather and saddlery, harness	Large	South, Tri-State	Northeast, Tri-State, Evansville
Clothing	Large	Tri-State, South	Northeast, Evansville
Hardware and iron. . . .	275,000	Tri-State, South	Northeast
Drugs and medicines. . .	78,065	Tri-State, South	Northeast
Queensware	51,000	Tri-State, North	New Orleans
Liquors.	452,352	Evansville, Tri- State, South, North	Evansville
Tobacco.	Large	Evansville, Tri- State, Northeast, South	Tri-State, Northeast

^aThese statistics of the principal non-retail trade of Commercial Evansville are based largely upon John W. Foster, Annual Report of the Board of Trade of Evansville, Indiana, for 1867 (Evansville, 1868), and Evansville histories.

The total retail trade was much less than the total wholesale (estimated, 1857, to be \$6,082,876), and much larger than the total manufactural production.

For further details, turn to Appendix II.

TABLE 18
WHOLESALE 1867

Commodity	Quantity	Chief Destinations	Chief Sources
Produce shipped			
Corn, bushels	1,999,707	Lower Miss. River	Tri-State
Wheat	89,192	Northeast; South	Tri-State
Oats	52,437	South	Tri-State
Barley	7,005	South	Tri-State
Flour, barrels	36,891	Northeast; South	Evansville
Corn meal	31,740	South	Evansville
Whiskey	4,061	South	Evansville
Tobacco, hogsheads	35,709	Northeast	Tri-State, Cumberland Valley
Hay, bales	15,477	South	Tri-State
Cotton	44,564	Northeast	Tenn. River (Ala., Miss., Tenn.) and Lower Miss. River
Provisions shipped			
Pork, barrels	4,052	South	Tri-State
Salt	92,927	North	New Orleans
Wholesale sales			
Drygoods, dollars	2,535,137	Tri-State; South	Northeast
Groceries	2,314,650	Tri-State	Northeast
Boots, shoes	921,915	Tri-State; South	Northeast
Leather, saddlery, har- ness	46,517	Tri-State; South	Northeast, Evansville
Clothing	450,000	Tri-State; South	Northeast
Hardware	510,007	Tri-State; South	Northeast
Iron	211,000	South; North	Local, North
Drugs, medicines	314,100	South	North, Local
Queensware	294,720	Tri-State; North	New Orleans York
Liquors	452,352	Tri-State; South	Local, North
Tobacco articles . . . .	.....	Tri-State; South	Local, North
Others . . . . .	.....	Tri-State	Northeast

^aThese statistics of the principal non-retail trade of Commercial Evansville are based largely upon John W. Foster, Annual Report of the Board of Trade of Evansville, Indiana, for 1867 (Evansville, 1868), also upon Evansville histories and newspapers.

The trade had surpassed that of 1857, despite the curtailment imposed by the early phases of the Civil War. Cotton and tobacco from the South had appeared.

For further details, turn to Appendix II.

TABLE 19

EVANSVILLE PACKET LINES 1867^a

Destination	Distance in Miles
Attica, on the Wabash, semi-weekly. . .	455
Bowling Green, on the Green River, daily	200
Cairo, on the Ohio, daily	200
Cannelton, on the Ohio, tri-weekly. . .	70
Cincinnati, on the Ohio, weekly	332
Eastport, on the Tennessee, semi-weekly	420
Louisville, on the Ohio, daily.	200
Memphis, on the Mississippi, semi-weekly	450
Nashville, on the Cumberland, semi-weekly.	235

^aData from John W. Foster, Annual Report of the Board of Trade of Evansville, Indiana, for 1867 (Evansville, 1868).

The Evansville packet service began about 1857. But, as early as 1852, five steamboats each made daily trips from Evansville into Green River.

For service in subsequent years, see Appendix I.

TABLE 20

COMMERCIAL COMMODITIES^a

Receipts at Evansville from			
Pittsburgh	New Orleans	Green River	Wabash River
Axes	Sugar	Tobacco	Beef, Pork
Boatstuff	Coffee	Eggs	Butter
Iron	Molasses	Flour	Tobacco
Nails	Rice	Lard	Leather
Tools	Pitch	Molasses	Whiskey
(Drygoods, coffee	Salt	Beef	Bran
sugar, and drugs	Oranges	Pork	Hides
reshipped from	Mackerel	Wheat	Lard
Baltimore, Phila-	Tin	Leather	Flour
delphia, New York)	Rosin	Hides	Wheat
	Raisins	Butter	Corn
		Bran	Eggs, Poultry
			Hay

^aData from Daniel W. Snapp, "Evansville's Channels of Trade and the Secession Movement 1850-1865," Indiana Historical Society Publications, VIII, No. 7 (Indianapolis, 1928), pp. 334-36.

Table 20 lists some of the outstanding receipts at Evansville during the sixties. Evansville's chief local trade areas were the business of the Green, White, and Lower Wabash rivers. In addition, Evansville traded extensively with the following Ohio River centers: Pittsburgh, Cincinnati, Louisville, Cannelton, Owensboro, Paducah, and Cairo; also with Nashville, on the Cumberland River.

TABLE 21

NET WHOLESALE 1929^a

Commodity ^b	Amount (\$1,000)
Total net wholesales.	61,096
Automotive.	1,713
Chemicals, drugs, etc.	316
Dry goods and apparel.	943
Farm products (n.e.s.).	17,327
Farm supplies (except machinery and equipment).	1,827
Food products (n.e.s.).	9,925
Furniture and house furnishings.	1,633
Groceries and food specialties.	10,296
Hardware.	3,227
Iron and steel scrap and waste.	627
Lumber and building materials (non-metal).	2,077
Machinery, equipment and supplies (non electrical).	2,441
Metals and minerals (non-petroleum).	429
Petroleum and petroleum products.	1,768
Plumbing and heating equipment and supplies.	1,072
Tobacco and tobacco products (non-leaf)	2,017

^aData from Bureau of the Census, Fifteenth Census of the United States, a separate pamphlet, Wholesale Distribution, Indiana (Washington: Government Printing Office, 1932), p. 21.

^bNet wholesales of Evansville, 1929.

later she advanced in redistribution of drugs and hardware, also drygoods, chiefly from New York.

By the late-twenties, a number of circumstances, plus freight-rate changes, tended toward realignment, and Commercial Evansville began to emphasize sales to the North, with relatively less to the South. Also, her purchase in the North had increased relatively, especially in the Northeast. In the wake of improved local roads (the erstwhile miserable conditions of which had, for long, braked the efforts of competitor-cities in their wholesaling in the Evansville Tri-State Area), auto-motor ascendancy, and financial innovations, her Tri-State wholesale area contracted, and Commercial Evansville's sales methods changed, gradually. But Evansville's corresponding retail Tri-State size expanded. Manu-

factural Evansville increasingly utilized some of the Area's materials, which formerly her sister-component had moved, such as wheat, also animals for slaughter and packing. Corn and hay increasingly were absorbed by animals on the farm. Manufactural Evansville's interest in tobacco had long-since shifted to leaf tobacco for cigars, not local tobacco, and Commercial Evansville had yielded to Henderson, Kentucky, supremacy in wholesaling Burley tobacco.

Coal

Abundant, cheap coal is one of the basic conditions underlying the vigorous condition of Manufactural Evansville. It also underlies her tendency toward emphasis upon materials.

Relatively small quantities had been used prior to the development of transportation by canal and rail. Towing of coal from upriver mines began about eighteen-fifty. Many of the potential coal centers were inaccessible to river transportation because of the high cost of wagon haulage to the river. Local mines were opened shortly after the turn of the half-century.

Coal mining in the Tri-State Area was stimulated by canal, river, and rail conveyance (Appendix I). In 1874 Evansville received upwards of a half-million tone (Table 22). Most of it was mined at Evansville, and some was barged locally. Only 40,000 tons were received from Pittsburgh; it came by river, and was used chiefly in the manufacture of gas. About the same amount was received by rail, from nearby sources. Four-fifths of the total receipts were consumed locally; the other fifth was resold at Evansville to steamboats.

In 1899 coal was being mined from about ten shafts within or near the city limits. Some sixty shafts were operating in an area within a radius of thirty miles, centering on Evansville. The price of coal available to Manufactural Evansville was from fifty cents to seventy-five cents per ton. While not of steamer quality, the Tri-State coal ranged from medium to a bit below medium in quality, for factory consumption. The price of upriver coal of high grade (chiefly from Pittsburgh) was medium, owing to cheapness of river-conveyance.

Manufactural Evansville's coal-supply pattern, as of the

TABLE 22
RECEIPTS OF COAL 1874^a

1. Total coal received at Evansville, tons.	543,268	
Mined at Evansville, and barged locally.		470,518
Received from Pittsburgh via river		40,000
chiefly for gas		
Received by rail from near sources		37,750
2. Total coal disposed of at Evansville	543,268	
Consumed in the city		422,767
Sold at Evansville to steamboats		120,501
3. Mines contributing to the city's supply		
2 at Newburgh, Indiana, via river, miles		16
2 at Spottsville, Kentucky, via river.		16
1 at Speer's Landing, via river.		20
1 within the city limits		
4 at Boonville, Indiana, via railroad.		20
2 at Shelburn, Indiana, via railroad		150
2 at Washington, Indiana, via railroad		87
1 at St. Benard Coal Mine, Kentucky, via		
rail		50
1 at Equality, Illinois, via railroad		

^aData based upon Charles E. Robert, Evansville, Her Commerce and Manufactures (Evansville: Courier Company, 1874), pp. 417-18

nineteen-thirties, is depicted in Figure 14. In addition, a small amount of high grade coal came from the mines of eastern Kentucky.

Manufacturing

Manufactural beginnings.--McGary sold some of his self-hand-made furniture to the villagers. Incipient Manufactural Evansville served the village through its: (1) Water-power (dam) flour and grist mill, founded (1814) just north of the village, where the state road to Princeton crosses Pigeon Creek; (2) saw mill (Fig. 1) opposite, and near, the flour-mill, on the middle course of the creek; (3) slaughtering houses, along the river front, and Pigeon Creek; (4) blacksmith shop, at Third and Locust streets (Fig. 2), also whitesmith and gunsmith shops, in and near Main Street; (5) tanneries, on the river front, and leather-shops, in Main Street; (6) newspaper (1821), in Main Street; and (7) other "downtown" combined trade-and-handicraft shops. Thus was fixed the locus of the oldest manufactural district of the city, i.e., the present Manufactural-Commercial District (Fig. 1); and

the next-oldest: the Evansville-Lamasco District (Fig. 16).

Manufactural infancy.--In infancy, the Manufactural Component plodded, wobbled, net-forward. It had some industry-births, few deaths, as summarized in Table 23. The first detailed report for Manufactural Evansville, by the United States Census, portrays her industries as summarized in Table 24 (for 1839).

She sold chiefly to the town; the Evansville Tri-State Area; and to centers on the Lower Ohio and the Lower Mississippi. She bought chiefly from: Evansville; the Evansville Tri-State Area; and the Upper Ohio. She swam in the wake of Commercial Evansville. She altered her manufactural land use pattern but little.

Vigorous adolescence.--Manufactural Evansville "found herself," beginning in the late eighteen-forties (as canal and rail loomed, commerce boomed, and Evansville received a state bank), in general during the mid-century. It advanced to upwards of sixty factories in 1857; ninety in 1859 (some of the "factories" were manned solely by the owner); to an estimated gross production topping one and one-half millions in 1857; and to an employment slightly exceeding nine hundred in 1859. The earliest available detail-breakdown portrayal is presented in Table 25, as of 1857.

The Component diversified during the period, through the birth of more than fifty manufactural industries. Deaths were few: chiefly reed cloth, furring, and flat-boats. Steamboat conveyance predominated. Manufactural Evansville expanded in manufactural trade areas (Table 26). Sales beyond the Evansville Tri-State Area exceeded the intra-ones; those to the South exceeded those to the North, but those in the territories of the Southern Freight Association and the Central Freight Association were nearly equal (Table 27). Purchases from within the Evansville Tri-State Area exceeded considerably those from beyond; those from the North exceeded considerably those from the South; finally, those from the Central Freight Association territory topped those from the Southern, which, in turn, topped greatly those from the Trunk Line Association.

The Component modified its land use pattern during the period. She also increased the density of her factories in manufactural districts A and B (Fig. 16; Table 28), and thereby emphasized the manufactural importance, then, of the river front; the mouth of Pigeon Creek; and the downtown area. Her pattern was

TABLE 23
BIRTHS AND DEATHS 1817-1929^a

Manufactural Group	1817-29	1830-44	1845-64	1865-1913	1914-33 ^b
Wood (births)	Cabinet-work. Crude furniture. Saw-milling.	Cabinet made furniture. Chairs. Cooperage. Flat boats. Kegs and Hogsheds. Planing mills. Wagons.	Boats and repairs. Boxes and crates. Carriages. Cigar boxes. Factory made furniture. Railroad repair shops. Shingles. Trunks.	Automobile bodies. Bathroom seats, tanks. Coffins. Constructional units for houses and other constructions. Egg and banana cases. Ice boxes. Kitchen cabinets. Large scale buggy production. Patterns. Railroad ties. Veneer.	Large scale production automobile bodies. Novelty furniture. Radio cabinets. Victrola cabinets.
Wood (deaths)		Crude furniture	Flat-boats.	Cabinet made furniture. Musical instruments. Steamboat construction and repairs. Trunks.	*Automobile bodies. Chair factories. (Revived 1933). *Cooperage Egg and banana Cases *Ice boxes. Shingles. Small cigar-box factories. Wagons.

TABLE 23--Continued

Manufactural Group	1817-29	1830-44	1845-64	1865-1913	1914-33 ^b
Metals and alloys (births)	Blacksmithing. Gunsmithing. Tinsmithing.	Architectural, Construotional, and ornamental products. Hand and farm tools. Hollow-ware. Iron foundries.	Agricultural implements and machinery. Bollers and machinery. Copper and brass found- ries. Edge tools. Iron safes. Rail- road repair shops. Sheet iron. Sorghum mills. Tobac- co and cotton presses. Stoves.	Bottle caps. Com- plex agricultural machinery. Elec- troplating. Elec- trotors. Enameled grates. Engraving Engines. Floral and other metal craft commodities. Furnaces. Furni- ture. Casters. Garage work. Lamp and other electrical equip- ment. Lightning rods. Metal beds. Plumbing supplies. Pumps. Railing and jail iron work. Railroad headlight Rolling mills. Steel scaffolding. Structural and building steels.	Aluminum castings. Ammunitions. Assembled automobiles. Automobile bodies. Auto- mobile en- gines and parts. Com- position bot- tle caps. Electrical battery units Electrical headlights. Enameling. Excavating machinery. Malleable castings. Material- handling equipment. Metal stamp- ing. Mining equipment. Refrigerators. Tin cans. Tractors.

Table 23--Continued

Manufactural Group	1817-29	1830-44	1845-64	1865-1913	1914-33b
Metals and alloys (deaths)				Gunsmlthing. Hol-low ware. Lightn-ing rods. Rolling mills. Steamboat building and re-pairs. Tinsmith-ing. *Ammunition. *Assembled automobiles. *Automobile bodies. Auto-mobile en-gines and parts. *Blacksmithing. *Excavating machinery. Headlights (oil). *Metal beds. *Railroad re-pair shops. Tractors.	
Foods (births)	Flour and grist milling. Slaughtering.		Bakeries. Candy. Coffee. Meat packing. Vinegar.	Butter and other dairy products. Cake and other packaged flour. Ice cream. Soft drinks. Vegetable canning.	Food for in-fants. Large-scale meat and produce packing. Na-tionally-dis-tributed flours. Other pharmaceutical food supplies. Revival of vegetable pro-cessing and canning. Soya flour.

TABLE 23--Continued

Manufactural Group	1817-29	1830-44	1845-64	1865-1913	1914-33 ^b
Foods (deaths)	.....	.....	.....	.....	.....
Tobacco (births)			Chewing tobacco. Cigars, pipe tobacco. Snuff.	Large scale production of cigars	Increase in machine-produced cigars.
Tobacco (deaths)			"	Snuff.	Small cigar factories.
Leather-textiles-clothing (births)	Tanning, Currying.	Bagging. Clothing. Furriers. Reed cloth. Rope.	Belting. Canvas and other heavy cotton articles for boats. Custom boots and shoes. Mattresses. Saddlery and harness. Trunks. Upholstering. Wool carding. Woolen mills.	Carpets. Cotton harnessing. Cotton hosiery. Cotton mills. Drop cloth and other cloth. Hats and caps. Mops. Oil cloth. Tarpsaulins. Tents and awnings. Valises.	Large-scale production of overalls, shirts, washable suits, etc. Rayon, silk, and lisle hosiery.
Leather-textiles-clothing (deaths)			Furriers. Reed cloth.	Carpets. Cotton hosiery. Currying. Custom boots and shoes. Heavy canvas articles for boats. Oil cloth. Rope. Tanning. Trunks. Valises. Woolen mills. Wool carding.	*Leather products.

TABLE 23--Continued

Manufactural Group	1817-29	1830-44	1845-64	1865-1913	1914-33 ^b
Stone-coal-sand-clay (births)		Bricks. Hollow-ware Stone-ware. Tile	Coke. Dressed stone. Gas Monuments. Pot-teries.	Concrete blocks Concrete burial monuments, ornaments. Electricity. Glass bottles, etc. Glass plating. Mirrors. Vitreous bath-room ware.	Concrete burial vaults, and trim-stone.
Stone-coal-sand-clay (deaths). .				Hollow-ware.	*Coke. Stoneware.
Paper--printing-publishing (births)	Newspapers.	Pamphlets.	Office supplies Paper mill. Printing, book and job.	Binding. Books. Engraving. Newspapers in German language. Paper boxes.	Color printing.
Paper--printing-publishing (deaths)					Newspaper in German language
Chemicals (births)		Candles	Patent medicines. Soap.	Bluing. Paints and varnishes. Pharmaceuticals.	Flavor extracts. Perfumes.
Chemicals (deaths)				Candles.	

TABLE 23--Continued

Manufactural Group	1817-29	1830-44	1845-64	1865-1913	1814-33 ^b
Others (births)		Brewing. Distilling.	Brooms. Photography. Wine.	Advertising Novelties. Blue-printing. Dyeing and cleaning. Ice. Power laundries. Rubber bathroom seats. Soft drinks.	Spectacle lenses.
Others (deaths)				Whiskey. Wine	Brewing (revived 1933).

^aThe data are based upon multitudinous sources.

^bIndustries marked with an asterisk indicate industries at a very low stage at the time, often fatal.

For a description of Table 23, by periods, turn to Appendix II.

TABLE 24
MANUFACTURING 1939^a

Industry ^b	Wage Earners	Gross Production
Breweries (1)	..	5,000 (gallons)
Bricks and lime.	53	\$4,200
Distilleries (1)	..	70,000 (gallons)
Flour-mills (2)	..	7,500 (barrels)
Furniture, not factory	7	\$2,700
Hats and caps.	2	\$600
Precious metals.	..	\$1,200
Printing (2) . . . . .	..	.....
Rope walks (1)	2	.....
Saw-mills (7) . . . . .	..	.....
Small arms	52	.....
Tanneries	2	6,600
Tobacco, not cigars.	19	24,200
Weekly newspapers (2) . . . . .	..	.....
Wagons	5	3,000

^aBased upon Department of State, Sixth Census of the United States 1840 (Washington: Thomas Allen, 1841), p. 290.

^bIn Vanderburg County. Almost all were in Evansville. Statistics for Manufactural Evansville, as of earlier dates, are even more fragmental.

TABLE 25
DETAIL-BREAKDOWN 1857^a

Industry	Gross Output (\$1,000)	Industry	Number of Factories	Locations
Flour and ship stuff.	477	Breweries	6	7th St. (Main and Sycamore); Fulton and Canal Streets; Fifth and Vine Streets; Water and Pearl Streets; 6th St. and Ingle
Feed and meal	10			
Cabinet ware and chairs	96			
Stoves, other castings.	120			
Steam boilers	166			
Steam engines and repairs		Brass		
Sawmill products.	62	foundry	1	1st St. and Pine.
Planing mill products	35	Carriages	3	127 Main Street; 156 Main Street; 172 Main Street.
Cooperage	20			
Tobacco	43			
Stoneware	11	Cabinet	4	168 Main Street; 152 Main Street; Main Street (6th and 7th); 4th Street (Clark and Leet).
Bakeries and confections.	67	makers		
Coppersmith and sheet iron.	10			
Edge tools.	5			
Brass foundries	6			
Blacksmith, wagons and carriages.	65	Foundries	4	Pine Street (1st and 2nd); Ingle and Canal Streets; Canal St. (Main and Sycamore); 7th Ave. (3d and Main).
Lard, oil, candles and soap	37			
Agricultural implements	13			
Saddlery and harness.	35			
Ale and beer.	58	Mattresses	3	6 north Water Street; 169 Main Street; Walnut (8th and 9th).
Tanneries, leather.	51			
Mattresses.	14			
Printing and binding.	29	Potteries	2	Honest John and Anne Streets; Main Street (8th and 9th).
Marble and stone.	51			
Tinsmiths and gunsmiths	125	Plows	1	8th Street and Division.
Bricks.	35	Planing mills		2nd St. (Chestnut and Cherry); 4th Street and Division.
Total.	1,635	Saddlers	2	50 Main Street; 53 Main Street;
			5	

TABLE 25--Continued

Industry	Gross Output (\$1,000)	Industry	Number of Factories	Locations
		Tobacco	2	37 Main Street; 80 Main Street; 113 Main Street.
		Wagons	2	105 Main Street; 25 Main Street.
		Coopers	6	7 North Third Street; Fulton Ave. and High Street. Oak Street (5th and 6th); 2nd St. and Bond; 1st St. and Leet; 4th St. and Leet; 158 Main Street; 174 Main Street.
		Printing	4	50 Main Street; 83 Main Street; 9 South First Street; 2 South Water Street.
		Furniture	2	Greektville; 168 Main Street
		Flour mills	7	2nd St. and Canal; Locust and Canal Streets; 8th and Canal; 8th and Walnut; 4th and Fulton Street; High Street.
		Cigars	2	1st St. (Pine and Leet); Main Street (1st and 2nd).
		Tanners	5	Pigeon Creek, near mouth; Pigeon Creek; Main Street; Main Street (Water and 1st); Main Street.

Footnote to Table 25

^aThe statistics of production, largely Federal, are probably based upon reporter, John W. Foster's survey of manufacturing in Evansville as of 1857. The data concerning the establishments were gleaned from W. H. Chandler, Director of the City of Evansville for 1858 (Evansville, 1858), the earliest directory of the city available.

The list of factories, chiefly as of 1857, is a bit incomplete. For example, it omits saw-mills. The details, however, present a breakdown of Manufactural Evansville, as of the late eighteenth-fifties, the earliest available. Some of the factories were operated solely by the owner.

TABLE 26

MID-CENTURY MANUFACTURAL TRADE AREAS

Manufactural Trade Areas	
<u>A. Chief Market Areas</u> City, and Evansville Tri-State Ohio Valley, below Louisville Wabash, north to Covington Green, south to Bowling Green Cumberland, to Nashville Tennessee, to Tusculumbia Mississippi, to St. Louis and New Orleans Missouri, to Kansas City	<u>I. Chief Supply Areas</u> City (Wholesale commodities; coal; clay, sand, gravel; water) Evansville Tri-State Area (Grain, animals, hides, furs, wool, timber, coal, tobacco) Lower Wabash Valley (Much as Tri- State, plus commodities via Great Lakes) Pittsburgh district (Iron and steel, boat stuffs, import- exports: monument stone, metals)
<u>B. Sold to South</u> Foods, especially corn, wheat, flour and pork Machinery, agricultural imple- ments, stoves, tools, and other products of metals Pottery Whiskey Beer Tobacco Furniture Saddles and harness Soap, and candles Some brick Lumber, products of planing mills	<u>II. Bought from South</u> Coffee and spices (via Evansville wholesale) Tropical lumber Irons and steels from St. Louis
<u>C. Sold to Extra-Evansville</u> <u>North</u> Largely same as South, except Plus: More processed iron More lumber, products of planing mills More boat equipment Steam boats Railroad cars Railroad repairs Coal mining equipment Newspapers Minus: Beer (except Tri-State)	<u>III. Bought from Extra-Evansville</u> <u>North</u> Grains Animals Animal products Coal Monument stone Iron and steel Brass and other metals Boat stuffs Some logs Machinery Tools Newsprint Mattress-cover material

TABLE 27
FREIGHT TERRITORY TRADE

Railroad Freight Territory	Ranking in Trade with Manufactural Evansville											
	1817-29		1830-44		1845-64		1865-1913		1914-33		Early 1930's	
	I ^a	E ^b	I	E	I	E	I	E	I	E	I	E
Southern Freight Association	2	2	1	2	1	2	1	2	1	2	2	2
Central Freight Association	1	1	1	1	2	1	2	1	2	1	1	1
Trunk Line Association	..	..	..	3	4	3	3	3	3	3	3	3
New England Freight Association	..	..	..	..	5	5	5	5	5	4	5	4
Southwestern Freight Bureau	..	..	..	..	3	5	3	6	4	4	4	4
Western Trunk Line Committee	..	..	..	..	5	4	6	4	6	4	6	4

^aImports from manufactural Evansville.

^bExports to manufactural Evansville.

Table 27 presents the estimated ranking of railroad freight territories, by periods, in (1) buying from Manufactural Evansville and (2) selling to her. Example: For the period, 1817-29, the territory of the Central Freight Association ranked first in both buying from Manufactural Evansville, and selling to her. But in the period, 1845-64, that territory ranked second in buying from her, and first in selling to her. The main source of her fuel has always been local; the main source of her materials has always been from the North; but the main destination of her products has varied from local in the incipient period, to South for a long succession of decades, to North in the early nineteen-thirties.

For more details of legend, turn to Appendix II.

TABLE 28

EVOLUTION: LAND USE PATTERN^a

Period	Manufactural Land Use Pattern
1817-1829	Small "factories" in and adjoining Main Street near the Ohio River, i.e., in the southern part of Manufacturing District A; saw-mill and grist-mill on Pigeon Creek north of the town (Fig. 16).
1830-1844	"Factories" chiefly in and near the business districts of Evansville and Lamasco, and in the Heterogeneous District (Manufacturing District B) between the southern parts of Evansville and Lamasco; also along the river front and near the mouth of Pigeon Creek.
1845-1864	Pattern expanded northward athwart Main Street, spottedly, in District A; increased development along the river front, near the mouth of Pigeon Creek, and in District B; launched into strips adjoining the Wabash and Erie Canal (District C) and the terminus of the railroad (antecedent of the Chicago and Eastern Illinois Railroad).
1865-1913	Pattern expanded and grew more dense in districts A, B, and in C, especially alongside the Joint Track Railroad. Early in the period: Overflowed into much of D especially near the Louisville and Nashville Railroad and (later) the western arc of the Belt Railroad; filtered into District E beyond the Lamasco business district in factories adjoining the Illinois Central Railroad, and flanking Pigeon Creek; small plants appeared in and near the business district of Independence (West Side), west of Pigeon Creek. Later in the period: Pattern vaulted, pioneered into District F and fanned out therein, mainly contiguous to the Belt Railroad; outposted in District G especially near the intersection of the Chicago and Eastern Illinois and the Southern railroads; seeded in District H near the Louisville and Nashville Railroad; transferred its abattoirs to peri-urban sites near the middle course of Pigeon Creek; developed peri-urban brick yards; some of the factories deserted water fronts; some moved from the older, crowded, inner parts of the city to newer, roomy sites in younger districts; a few, selling chiefly in Evansville, moved to the inner portion of the city. The first half of the period witnessed the heyday and congestion of saw-milling and other wood-working on the lower water frontage, with vast strings and jams of logs herded alongside and ashore, especially the river, Sweezer Pond and the mouth of Pigeon Creek. The period witnessed also the rise and decline of manufacturing along the north banks of the hairpin curve of the Ohio River.

1914-1933 Chief changes: Increased concentration of plants in districts H, and especially F and G with available land and railroad service; transference of some plants city-marginward; incipient paucity of available, roomy sites, on the terrace.

^aData based upon multitudinous sources, especially maps, Evansville histories, and city directories; also, statistical analysis.

Table 28 highlights the evolution of the land use pattern of Manufactural Evansville, by periods, in gross detail. Conveyance routes have been the most important distributional factor, ably seconded by the locality factor in inner and outer parts of the city, a factor of centripetal and centrifugal "forces."

on the threshold of pattern-changes in adjustment to the adventing dominant conveyance mode, i.e., the railroad.

Multitudinous period.--During the period, 1865-1913, Manufactural Evansville passed through the later phases of youth and attained maturity, and, incidently, experienced its climax of multitudinous (705) factories, mostly small, as reported by the Census for 1899. This was 237 per cent of the number reported for 1914. That is to say, a trend, nation-wide, set in toward fewer, but larger, firms. The Component also peaked in the diversity of its products; but it swam decreasingly in the wake of Commercial Evansville. Near the turn of the century, manufactural production surpassed in dollar volume Evansville's wholesale business.

The manufacturing advanced gradually, firmly. It evolved placidly in gross component-structure, in lines with its quasi-isolated position, and the national placidity during the period between the Civil War and World War I. There was a climax of industry-births and a moderate number of deaths and recessions (Table 23). There was, also, an incipient inflow of capital, mostly from the North, as well as a small inflow of people, mostly from the Northeast. Quantity-production became more marked, in keeping with the manufactural emphasis upon materials. The mode of conveyance became rail.

The Component expanded her manufactural trade areas. The South was rehabilitating from the effects of the Civil War, and was expanding southwestward. Evansville found enlarging markets

in the agricultural and industrial portions of the North, especially in the Corn Belt. Freight-rate advantages arose. But there was no marked change in her gross trade pattern as to North versus South. However, there was recession in her resourceland, i.e., the distance from her materials, all in all, was increasing.

She modified her manufactural land use pattern strikingly. By the end of the period factories had moved into all of the Evansville manufactural districts as of 1933. There was definite re-alignment of her factories as they increasingly pivoted on transportation by rail, especially in districts C-H. Other factors affected the distribution of factories, as is discussed in Chapter IV.

Tidal period.--Manufactural Evansville flooded and ebbed during the tidal period, 1915-33. She neap-flooded during World War I, and subsequently ebbed. She spring-flooded during Great Boom I (culminating in 1929), and they spring-ebbed in Great Depression I (with nadir in the early thirties). The net-result was as follows: (1) In the item, wage earners: 103 hundred in 1914; 140 hundred in 1929; 97 hundred in 1933, and 134 in 1939. (2) In gross production: 31 million in 1914; 91 in 1929; 21 in 1933; and 130 in 1939. (3) In manufactural increment: 12 million in 1914; 42 in 1929; 21 in 1933; and 60 in 1939.

There were other significant changes. There was decline in number of establishments, increase (nearly double) in the average size, and increase (more than double) in the gross output per firm (Table 6). The Component became increasingly dominated by its total of large firms (Tables 29 and 30). The smaller establishments constituted a majority of the firms, as of 1932; but the larger firms employed a majority of the wage earners. The bulk of the gross production of Manufactural Evansville was produced by its larger firms, as early as 1919. There was increase in control by corporations, increasingly extra-Evansville. Manufactural emphasis upon materials and quantity-production, both remained high. But the Component augmented in refinement of product, for the percentage-increase of increment exceeded that of gross production, also the use of technology increased, as did the percentage of high-class freight. There was small, but significant, influx of labor from afar, and significant upswing in quality of business-organization. Manufactural Evansville experienced alteration in the align-

TABLE 29

FACTORIES GROUPED AS PER WAGE EARNERS^a

Firm ^b Groups by Wage Earners	1914 Number of Firms	1919				1932			
		Firms		Wage Earners		Firms		Wage Earners	
		Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
0 ^c	48	21	7	0	0	5	3	0	0
1-5	92	117	39	251	2	55	32	163	2
6-20	66	60	20	686	6	52	31	603	6
21-50	42	35	12	1,099	9	20	12	635	7
51-100	28	32	11	2,470	20	19	11	1,429	15
101-250	14	28	7	4,220	34	12	7	1,558	16
251-500	3	3	1	1,088	9	5	3	1,868	19
500-1,000	3	2	0.7	1,143	9	2	1	1,360	15
1,000 plus	1	1	0.3	1,569	13	1	0.6	2,100	22
Total	297	299	98.0	12,526	102	171	100.6	9,716	102

^aData for 1932 are based upon personal interviews; for 1919 based upon Bureau of the Census, Fourteenth Census of the United States, IX (Washington: Government Printing Office, 1923), pp.383-5.

^bSize of Evansville's manufactural establishments in terms of establishments grouped on the basis of number of wage earners. The smaller establishments constitute the majority of the firms, but the larger establishments employ a majority of the wage earners. The year 1919 was at the close of the boom; the year 1932, in the depression.

^cFactories worked by owners and officials.

Table 30

FACTORIES GROUPED AS PER PRODUCTION^a

Firm Groups by Gross Production(\$1,000) ^b	Per Cent of Total Establishments	Per Cent of Total Wage Earners	Per Cent of Total Gross Production
5 minus	20.7	0.3	0.2
5-20	20.1	1.5	.9
20-100	24.4	6.7	5.1
100-500	24.7	35.3	27.6
500-1,000	6.7	26.0	20.4
1,000 plus	3.3	30.2	45.8

^aData from Bureau of the Census, Fourteenth Census of the United States, IX (Washington: Government Printing Office, 1923), p. 385.

^bDescription of Evansville's manufactural establishments in terms of wage earners and gross production of establishment-groups classified as to gross production, 1919. The bulk of the wage earners and of the gross production of manufactural Evansville are of the larger factories.

ment of its manufactural Groups (metals took the lead); and in evolution, birth, and mortality in categories (Tables 2, 16, and Appendix I).

During the tidal period, the manufactural sales-pattern was altered sharply; the manufactural supply-pattern was altered less sharply, but fully as significantly, as disclosed in Chapter V. Suffice to say, here, that there was a shift in the dominant direction of sales from southward to northward; also, that, by the end of the period, there had taken place a strong distance-recession in source of materials (fuels had remained proximal). Manufactural trade-minutia are presented systematically in Appendix I.

During the tidal period the gross manufactural land use pattern, especially as of the manufactural Districts, persisted in the main; but there were changes. There was some recession: A manufactural area, herein designated as the Decadent District, became largely void of factories. It is the district which extends roughly westward from the mouth of Pigeon Creek to St. Joseph Avenue, and southward from Ohio Street to the Ohio River (Figs. 2 and 16). Despite a number of handicaps, this district had potentialities. It was used during World War II for quasi-temporary buildings in which were carried on large-scale manufactural operations, especially the production of boats, or small ships, for war purposes. By the nineteen-thirties, had appeared considerable recession in the southwestern part of Manufactural District B, on the eastern margin of Pigeon Creek, near its mouth. This recession was related in part to decline in saw-milling and other wood-work. Recession appeared, also, in spots in the older and inner parts of the city, largely owing to changes incident to city-evolution. There was some advance and expansion: Such changes took place spottedly in the inner and older parts of the city, especially in facets known as "light" manufacturing. These facet-changes, also, were related to city-evolution. During the period intensive, modern development occurred in District F, based on the Belt Line Railroad, alongside of which were roomy parcels of land, on the margin of the city. Areal expansion was most marked toward the northeastern part of the city, most outstandingly in District G, where numerous large, ground-floor types of factories were erected, some on virgin land, which had been held for industrial development.

Among other factors pertinent to expansion in District G, was its city-location, and conveyance location, in line with the increased alignment of Evansville with the northeastern part of the United States. Expansion of a smaller magnitude was made in District E and District H. There was manufactural dormancy, as in the southeastern part of the city, because of zonal restrictions. There was incipient scarcity of unoccupied land, within the city, favorable for future manufactural expansion.

Population Pattern

The population of Evansville is herein noted, as of 1930, mainly from the standpoint of manufacturing.¹ The population, which was distributed mainly on the terrace, and subordinately on hill-slopes (especially on the west side of the city), was relatively sparse in the manufactural districts (Figs. 16 and 38). In such districts the amount of residential land was small; but the amount of manufactural land, large (Fig. 1). There was a high density of population within the Railroad Ellipse; in it lived many of the manufactural wage earners. The greatest concentration of population, however, was in an area immediately southeast of the Ellipse and east of the Central Business District. This concentration attained 30,000 per square miles of residential land. Many of the people in this area of high concentration (chiefly negro) were manufactural employees. The manufactural element of the population was scattered throughout the city; but it is inferred that a large percentage of such element lived near the factories in which the employees worked. The inference is based upon inquiries which revealed that a large percentage of the manufactural workers did, in fact, live within walking distance of "their" factories. By inquiry it was ascertained that probably less than a thousand of the manufactural employees lived beyond the city.

None of the residential districts bordering on the manufactural districts of the city were classed as higher than medium (Fig. 1). Much of the lands of these residential districts were rated less than medium. The largest, choice residential area of

¹Miss Edith Parker has emphasized logical analysis from a postulated point of view, especially in geographical analysis based upon a given definition of that subject.

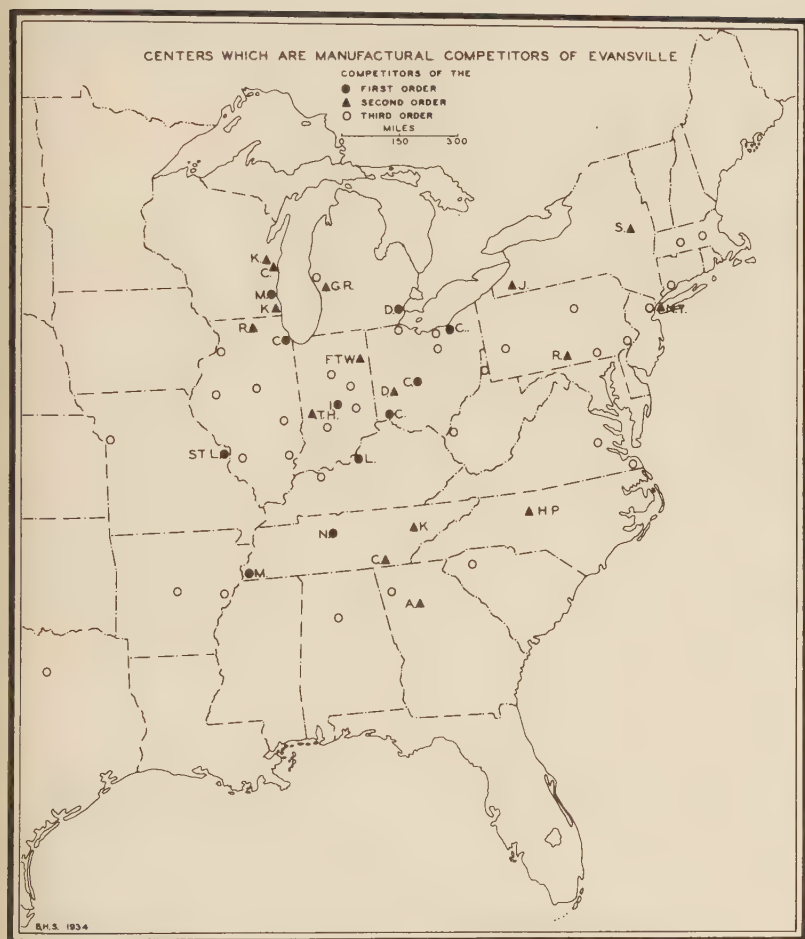


Fig. 37.--Manufactural Competitors of Evansville, 1933.

the city was in the southeast, which was essentially void of factories and railroads.

The alignment of the manufactural element of the city in the occupational structure of the city is ascertainable in Appendix I.

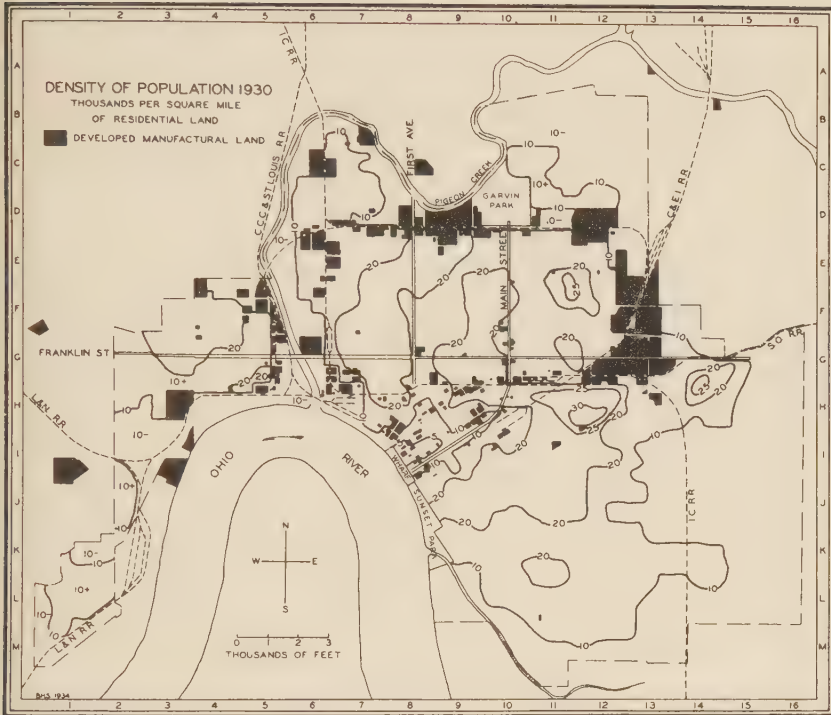


Fig. 38.--Density of population 1930. The procedure used in the preparation of this map was as follows: A dot map was prepared from data provided by the Evansville City Plan Commission (population by city blocks; a map showing by lots the number of square feet of land per family). The dot map was divided into small rectangles and the residential acreage of each rectangle was calculated. From these data the density per square mile of residential land was calculated for each rectangle, and the figure was placed in the proper place within the rectangle. Finally isopleths were drawn.

CHAPTER IV

MANUFACTURING PLANTS DEPLOYMENT, ALIGNMENT, DISTRICTS

Evidence of discernible order in the manufactural land use pattern of the city and its inter-relationships with the land use pattern of Evansville, appears precedingly. In Chapter IV such evidence is multiplied to bring the order into closer examination. However, the emphasis at this juncture is mainly on distribution of the manufacturing plants from four points of view, namely (1) the growth, or successive deployment of the plants as the city grew areally; (2) the alignments of the plants, or the "correlations of factory distribution"; (3) the manufactural districts as of 1933; and, finally, (4) the probable direction of future expansion of manufacturing.

Section 1. Areal Growth

Manufactural Evansville, through the successive deployment of the plants, grew areally largely with order. The order in the pattern engross is largely apparent; but the order in the pattern in detail, though present, is made discernible, in some phases, only by means of intensive analysis (Figs. 1-2; 16-17; and 30-32; Table 28; and Appendix I).

Sproutings.--The pattern made by the plants sprouted in, and adjacent to, lower Main Street, in a water-fronted fringe (river and creek), and (later) in Lamasco. Sproutings in the settlement of West Side (Franklin, or Independence), are obscure.¹

Manner of growth.--The manufactural land use pattern spread spottedly; never much beyond the city limits of the period; influenced much by conveyance ways, locality in the city, destination of products, and the evolutionary stage of the urban land-use pattern.

It vaulted aperiodically as outliers into strips of land

¹As early as 1870 there were factories within the central part of West Side; but the incipient manufactural-component serving the West Side was smaller than that of Evansville and Lamasco.

threaded by the Wabash and Erie Canal, and by railroads as they successively penetrated the city and lured its growth outward. Later the pattern of each outlier expanded and grew more dense.

The pattern was excluded from much of the southeastern part of the city by absence of good railroad facilities, later by zoning restrictions since this part of the city included the choice residence portion of Evansville.

Spreadings.--In brief the areal growth was as follows. After its sproutings, manufacturing spread northwest in an area which lay between the cores of Evansville and Lamasco, and which area was bordered by the Ohio River, Pigeon Creek, and (later) the Joint Track Railroad. It pivoted on the conveyance-ways and the town cores.

The next development took place in the ribbons bordering the Joint Track (a short distance farther north than the Central Business District) when the Joint Track was laid through the city to connect the ancestors of the Chicago and Eastern Illinois with the Louisville and Nashville. Therein manufacturing pivoted largely upon the business cores and the railroad.

The fourth development, which took place immediately west of Pigeon Creek, was based largely upon saw-milling and associated wood-working. Its connections were largely river (via creek) and rail.

Later the area east of Pigeon Creek came into prominence. It was served chiefly by the Illinois Central Railroad, although it had, in part, close connections with Lamasco.

With the construction of the Belt Line Railroad on the, then, northern margin of the city, manufacturing advanced into ribbons adjoining it, to depend upon it for transportation.

More recently, roomy areas in the northeast (served by the Chicago and Eastern Illinois) and the southwest (served by the Louisville and Nashville) developed.

The advance in manufacturing, 1910-1933, was chiefly in the northeast, although there was substantial development in the north, and in the southwest.

Section 2. Alignment of Factories

The chief alignment of factories has been with the terrace, conveyanceways, and city-localities.

Terrace Alignment

The overall factor in the distribution of the factories has been the terrace. Some 193 of the 197 plants mapped, as of 1933, were on the terrace. The nearly smooth and nearly level surface, grooved strikingly only by Pigeon Creek, offers a large measure of topographical freedom of distribution to manufactural plants.

Alignment with Conveyance Ways

The prime major-factor in the distribution has been the conveyance ways.

The Ohio River and the lower part of Pigeon Creek led in early days, with their factory-fringes fronting on them. Some 15 per cent of the mapped manufactural plants, as of 1933 (accounting for 7 per cent of the manufactural wage earners, as of 1929), were distributed within two squares of the Ohio River. Corresponding figures for Pigeon Creek were 15 per cent, and 11 per cent.

The Wabash and Erie Canal subordinately, but definitely, attracted factories to its banks and the neighborhood (in Evansville).

The railroads have been the most important component of the conveyance ways, in the alignment of factories. Among the railroad-fringes of earlier factories which once used the water ways, many of such factories have reoriented upon the railroads; as have, also, most of the stream-border plants. In 1933, some 51 per cent of the mapped manufactural plants (accounting for 80 per cent of the manufactural wage earners, as of 1929) had railroad sidings; and some 62 per cent of all the mapped factories were within two squares of a railroad. In 1933, the most striking feature of the manufactural land-use pattern was the "Circle" or "Ellipse," an oval ring, studded with factories adjoining railroad tracks, which together constituted the oval.

Alignment with Locality in the City

Almost co-prime with the conveyance ways as a major distributional-factor, has been locality in the city of Evansville, as has been revealed by a study of the distribution of the manufactural plants, as of 1933, supplemented by a study of plant-

distribution, which extends as far back as 1860. Herein the discussion of locality is confined to the "inner" versus the "outer" parts of the city.

As has been emphasized by Charles C. Colby, the inner parts of a city are affected dominantly by centripetal "forces." For Evansville, the components of the inner parts are assumed to be the downtown locality, and the near-downtown locality. Triple-centered Evansville has three inner parts. In like manner, the outer parts of Evansville, affected dominantly by centrifugal "forces," have, as assumed components, the intermediate locality, the peripheral locality, and the peri-urban locality. These outer components of Evansville are largely locality-zones complicatingly concentric on the three inner parts of Evansville.

Alignment vs. kinds of plants.--There was partial congregation of factories (i.e., some alignment) in terms of locality and kinds of plants (specifically categories, and the nine manufacturing Groups), as of 1933.

Of the two kinds of congregation, the partial locality-congregation in terms of manufacturing categories was the more pronounced (Table 31). There were 18 categories distributed dominantly in the inner parts of the city: (1) In the downtown localities were 11 categories, as, for example, printing-publishing; and (2) in the near-downtown localities were 7 categories, e.g., monuments and cut-stone. Likewise there were 25 categories distributed dominantly in the outer parts of the city: (1) In the intermediate localities were 14 categories, e.g., saw-mills; (2) in the peripheral localities, 10 categories, e.g., furniture; and (3) in the peri-urban locality, 1 category, e.g., brick-tile. Likewise there were 12 categories which had a heterogeneous location in terms of locality, for example, flour-mills and planing-mills.

Of the two kinds of congregation, the partial locality-congregation in terms of the nine manufacturing Groups was the less pronounced; but it was discernible (Table 32). Four Groups tended to localize in the inner parts of the city: (1) printing-publishing, (2) tobacco, (3) food, and (4) leather-textiles-clothing. Two groups favored the outer parts, namely, wood, and metals-alloys. Less localized were the three Groups: chemicals, coal-stone-clay-sand, and miscellaneous.

TABLE 31
LOCALITY VS. CATEGORIES^a

Arrays of Categories	Number of Plants Located: ^k				
	V	W	X	Y	Z
Array 1					
Bakery, wholesale.	6	1	0	0	0
Bottle caps.	1	0	0	0	0
Candy and confectioneries.	2	0	0	0	0
Cigars	4	1 ^b	0	0	0
Clothing	2	1	0	0	0
Coffee, spices	2	0	0	0	0
Coffins	1 ^b	0	0	0	0
Leather and harness.	2 ¹	0	0	1	0
Patent medicines	2	1 ^c	0	0	0
Printing and publishing.	13	1	1	0	0
Tents and awnings.	1	0	0	0	0
Array 2					
Boxes and crates	2	3	1	1	0
Dairy, creamery, ice cream	2	3	1	0	0
Foundries.	0	3 ^j	0	2	0
Gas.	0	1 ^c	0	0	0
Machinery, machine parts	28 ^g	5 ^j	1	2	0
Monuments and cut-stone.	1 ^d	3 ^g	0	0	0
Paper.	0	1 ^b	0	0	0
Array 3					
Architectural, structural and ornamental iron and steel; scaffolding.	0	1 ^c	2	1	0
Automobile bodies and parts.	0	0	3	1	0
Canning.	0	0	1	0	0
Concrete products.	0	0	2	1	0
Glass.	0	0	1	0	0
Malleable iron-castings.	0	0	1	0	0
Mirror plating	0	0	2	1	0
Pharmaceuticals.	0	0	1	0	0
Pottery.	0	0	1	0	0
Railroad ties, treated	0	0	1	0	0
Refrigerators.	0	0	1	0	0
Saw mills.	0	0	4 ^h	0	0
Stoves	0	1	4	0	0
Vinegar.	0	0	1	0	0
Array 4					
Bathroom seats	0	0	1	2	0
Casters, furniture fixtures.	0	0	0	2	0
Electrical implements.	0	0	0	1	0
Enamelling and metal-plating	1	1	0	2	0
Excavating machinery	0	0	0	1	0
Furniture.	1 ^c	4 ¹	1 ^h	1 ³	0
Produce-packing.	0	0	0	1	0
Slaughtering, meat-packing	0	0	0	3 ^e	3
Textiles	1	0	0	2	0
Wagon parts.	0	0	0	1 ^d	0

TABLE 31--Continued

Arrays of Categories	Number of Plants Located: ^k				
	V	W	X	Y	Z
Array 5					
Brick and tile.	0	0	0	0	3
Array 6					
Agricultural implements	1 ^b	1 ^c	0	1	0
Breweries	1 ^b	1	0	0	0
Brooms.	0	0	1	1	0
Cooperage	1 ^d	1	0	1	0
Electric power.	1 ^d	0	0	1	0
Flour-mills	1 ^d	2 ^e	2	1	0
Hand tools.	0	0	1	1	0
Ice	1	1	1	0	0
Mattresses.	0	1	1	0	0
Metal stampings	0	0	1	1	0
Paints, varnishes	1 ^d	0	1	0	0
Planing-mills	1 ^d	2	2 ^g	2	0

^aData based largely upon questionnaires, city histories, and city directories.

^bPeripheral when started.

^cIntermediate when started.

^dNear-downtown when started.

^eDowntown when started.

^gOne of these was peripheral when started.

^hTwo of these were peripheral when started.

ⁱOne of these was intermediate when started.

^jTwo of these were intermediate when started.

^kThe locality symbols herein used are: V, downtown; W, near-downtown; X, intermediate; Y, peripheral; and Z, peri-urban. The same symbols are used to designate these localities in the city, in Tables 31-38.

TABLE 32

LOCALITY VS. GROUPS^a

Manufactural Group	Number of Plants Located: ^b				
	V	W	X	Y	Z
Printing-publishing-paper.	13	2	1	0	0
Tobacco.	4	1	1	0	0
Food	13	6	6	5	3
Leather-textiles-clothing.	6	2	1	3	0
Chemicals.	3	1	1	1	0
Coal-stone-clay-sand	3	3	6	2	3
Miscellaneous.	2	2	2	2	0
Metals	5	11	16	18	0
Wood	6	11	22	21	0

^aData based upon primary material.

^bThe city locality symbols are the same as used in Table 31. Table 32 presents the locality distribution of plants, by manufactural Groups, in Evansville, as of 1933. For further description of the table, turn to Appendix II.

Alignment vs. ages of firms.--There was pronounced congregation of factories in terms of locality and the ages of the firms occupying the plants (Table 33).

TABLE 33

LOCALITY VS. AGE OF FIRMS^a

Years in Operation	Per Cent of Total Plants	Number and Percentage of Plants Located:				
		V	W	X	Y	Z
1- 10. . .	13	6(21) ^b	4(14)	5(18)	12(43)	1
11- 20. . .	23	13(28)	6(13)	15(33)	10(22)	2
21- 30. . .	20	16(40)	6(15)	6(15)	11(28)	1
31- 40. . .	14	8(28)	4(14)	10(35)	7(24)	0
41- 50. . .	12	6(26)	5(22)	6(26)	5(22)	1
51- 60. . .	8	9(56)	4(25)	1(6)	2(13)	0
61- 70. . .	6	4(33)	5(42)	1(8)	2(16)	0
71- 80. . .	4	2(25)	5(62)	0....	1(8)	0
81- 90. . .	1/2	0....	1(100)	0....	0....	0
91-100. . .	1/2	1(100)	0....	0....	0....	0

^aThe age data are based largely upon questionnaires, supplemented by city histories, and city directories.

^bThe statistics within parentheses refer to the percentage of the plants of the decade. Example: The 6 plants located downtown, which, in 1932, had been operating from 1-10 years constituted roughly 21 per cent of the total of the 28 plants which, in 1932, had been operating from 1-10 years.

The older firms (what was left of them) tended to be located downtown and near-downtown. Of the firms from 51-100 years old, 82 per cent were located in the inner parts of the city. Also, thus localized were 90 per cent of the firms from 71 to 100 years old.

The younger firms were somewhat partial to the outer parts of the city. Of the firms from 1 to 50 years old, only 45 per cent were located downtown and near-downtown.¹

Alignment vs. majority-sales.--There was striking, selective locality-distribution of the plants in line with location of their majority-sales, i.e., in line with accessibility to market (Table 34).

The plants which sold chiefly in Evansville were partial to the inner parts of the city, as is attested by the fact that 70 per cent were located downtown and near-downtown. Conversely, the plants which sold chiefly beyond the Evansville Tri-State Area were congregated mainly (70 per cent) in the outer parts of the city.

TABLE 34
LOCALITY VS. MARKET^a

Class of Plants Selling Chiefly:	Percentage of Each Class of Manufactural Plants Located: ^b			
	V	W	X	YZ
In Evansville ^c	48	22	16	14
In Tri-State Area beyond Evansville ^d	33	37	27	13
Beyond Evansville Tri- State Area ^e	14	15	30	41

^aData based chiefly upon questionnaires and field work.

^bThe symbols to designate locality in the city same.

^cSome 67 plants, and 736 manufacturing wage earners.

^dSome 15 plants, and 173 manufacturing wage earners.

^eSome 106 plants, and 8,700 manufacturing wage earners.

For further description of Table 34, turn to Appendix II.

¹One may expect that, as the city ages, some of those firms will vanish, some move to outer localities; some now in intermediate localities will be engulfed by the expansion of the near-downtown locality.

Alignment vs. railroad-service.--Correlation existed between locality and direct railroad-service to the manufactural plants, for the service was more intimate in outer Evansville (Table 35).

TABLE 35
LOCALITY VS. RAILROAD SIDINGS^a

Factory Grounds, 1933 Manufactural Wage Earners, 1929	v ^d	W	X	Y	Z	V-Z
With railroad sidings ^e						
A.	6 ^b	17	39 ^c	36	2	100
B.	1 ^b	20	48 ^c	30	1	100
Without such sidings ^e						
A.	52	24	9	12	3	100
B.	65	14	8	12	1	100
Percentage ratios ^f						
C.	12	74	444	336	66	108
D.	5 ^b	643	2,594	1,177	240	450

^aData based largely upon primary material.

^bAbnormally low, due to inoperative breweries.

^cThe very high percentage of railroad mileage is in the intermediate part of the city.

^dSymbols designating locality are the same as those used in Table 31.

^eHerein the symbol, A, means: percentage of their total number. Likewise, the symbol, B, means: percentage of their total manufactural wage earners.

^fHerein the symbol, C, means: number of grounds with sidings vs. number with none. Likewise, the symbol, D, means: number of earners of grounds with sidings vs. earners of grounds with none.

Table 35 presents the distribution of factory grounds having railroad sidings (railway or street freight-railway), and having none, as of 1933. For further description of the table, turn to Appendix II.

Only 23 per cent of the manufactural grounds with railroad sidings were located in inner Evansville, whereas some 76 per cent of the grounds without sidings were located thus. The percentage-ratio of the number of earners in factories with railroad sidings versus the number with none was very high in the outer parts of

the city, but very low in the inner parts.

Alignment vs. roomy grounds.--With some exception, there was concentration of the roomier grounds (small percentage ratio of the factory-covered area versus the area of the entire plant-ground) in the outer parts of Evansville; and the converse was true (Table 36).

TABLE 36
LOCALITY VS. ROOMY GROUNDS^a

Percentage Groups ^b	Number and Percentage of Manufactory Plants					
	V	W	X	Y	Z	V-Z
1-25 per cent.						
Number of plants. .	0	3	12	16	6	37
Per cent of plants.	0	8	33	43	16	100
26-50 per cent						
Number of plants. .	6	5	16	24	0	51
Per cent of plants.	12	10	31	47	0	100
51-75 per cent						
Number of plants. .	13	12	12	6	0	43
Per cent of plants.	30	28	28	14	0	100
76-100 per cent						
Number of plants. .	36	19	8	3	0	66
Per cent of plants.	55	29	12	4	0	100

^aData based largely upon primary information.

^bPercentage ratio of factory-covered area to the area of the factory ground.

Table 36 presents the locality distribution of Evansville manufactory plants on the basis of percentage ratio of ground covered by the factory to the acreage of the factory grounds, as of 1933. For further description of the table, turn to Appendix II.

Some 73 per cent of the more-crowded grounds were "inner," whereas some 84 per cent of the more-roomy grounds were "outer." For the array of grounds with greatest crowding, the percentage "inner" was 84; for the array with least crowding, the percentage "outer" was 92. Furniture, the most representative single manufactory category in Evansville (1930's), marched in the type of the moderately-roomy grounds, although chiefly in the intermediate and peripheral localities of the city (Table 37).

TABLE 37
LOCALITY VS. FURNITURE PLANTS^a

Percentage Groups ^b	Number of Furniture Factories Located:				
	V	W	X	Y	Total
1- 25 per cent.	0	0	0	4	4
26- 50 per cent.	1	1	7	8	17
51- 75 per cent.	0	1	2	0	3
76-100 per cent.	0	1	2	1	4
Totals	1	3	11	13	28

^aData based largely upon primary information.

^bPercentage ratio of building-covered ground to the total area of the plant's grounds.

Table 37 presents the distribution of the furniture manufacturing plants of Evansville on the basis of the percentage ratio of the building-covered area to the total ground acreage of the plant, as of 1933. For further description of the table, turn to Appendix II.

Other locality correlations.--There was correlation between locality in the city versus other manufacturing details (Table 38). The plants of the inner parts of the city were predominantly of small:

- A. Grounds
- B. Gross floor space
- C. Number of workers per plant
- D. Total ground-acreage
- E. Total number of workers
- F. Total gross floor-space
- G. Yards
- H. Percentage of buildings of the ground-floor type (i.e., they were dominantly of the multiple-floor type).

Alignment with Availability of Land

Another major factor with distributional-significance has been the item, availability of land (and, or, buildings) for use in launchment of manufacturing enterprises. Now, such availability is related, in part, to the locality's stage of evolution in its urban land-use pattern. Accordingly, it is in order, at this juncture, to digress in examination of stages in the evolution of urban land-use patterns,¹ preliminary to further discussion.

¹Wellington D. Jones, Robert S. Platt, Henry M. Leppard, and others, have brought forward urban land-use mapping.

TABLE 38
LOCALITY VS. MISCELLANEOUS^a

Manufactural Trait	Locality of the Factories					
	V-Z	V	W	X	Y	Z
Percentage dominantly ground-floor.	54	18	15	27	37	3
Percentage dominantly multiple-floor.	38	47	27	24	12	0
Percentage dominantly neither.	8	34	40	13	13	0
Percentage of gross floor-space	100	14	18	33	33	2
Percentage of developed factory ground	100	5	8	38	43	6
Percentage ratio of gross floor-space to factory ground	53	146	116	48	40	19
Percentage manufacturing wage earners 1929	100	12	19	39	29	1
Average number manufacturing wage earners per plant 1929.	80	37	75	128	95	21
Average gross floor-space per plant, acres	1.31	.65	1.12	1.69	1.57	0.81
Average size of grounds, acres	2.49	.44	1.01	3.51	3.92	4.31

^aData based chiefly upon primary information, concerning 197 plants, as of 1933.

Table 38 presents the distribution of selected manufacturing traits exhibited by the inner and outer parts of Evansville. With small exception, there was a high degree of correlation. The plants of the inner parts of the city were predominantly of small (1) grounds, (2) gross floor-space, (3) number of workers per plant, (4) total ground acreage, (5) total gross floor-space, (6) total number of workers, and (7) yards; and the buildings were predominantly of the multiple-floor type. The reverse was true of the plants of the outer parts of the city.

Urban land-use patterns.--Four stages in the evolution of the urban land-use pattern are herein examined. (1) In old age, the urban land-use pattern is subject to modification, but only with great difficulty. There are solidly built-up blocks with costly sites and buildings. (2) In maturity, the urban pattern is subject to modification with difficulty but not great difficulty. The streets are improved; the blocks have few vacant lots, except such open spots at parks. (3) In youth, the pattern is subject to modification with ease. The streets are laid out, and many are improved. Some squares are void of buildings; but others

are peppered therewith. (4) In infancy, the urban land-use pattern is largely awaiting creation, or fixation. Some of the streets have been laid out; fewer have been improved. Many squares are void, or predominantly void, of buildings. Locally the street-pattern, and building-pattern, are potentially capable of modification in line with a large project.

Evansville's land-use pattern.--Evansville had become a small city before Manufactural Evansville struck her stride. The prospective manufacturer had to meet the effect of the stage of the land-use pattern of his locality.

The heart of the Central Business District, as of 1933, had attained a stage of old age in the urban land-use pattern. It was largely void of factories, except for a few, scattered "loft" (upper story) factories, such as grinding-lenses; printing; bakeries.

The inner part of Evansville, as of the eighteen-fifties, exhibited a pattern much of which was mature. Such was much of the Evansville down-town, as of the nineteen-thirties (essentially the Manufactural-Commercial District), as was also the Lamasco-Evansville manufactural district. There were numerous scattered factories, most of which were small (nine-tenths were less than one-half block in size, 1933). Prospective manufacturers largely had to compete with house-builders, commercial and business firms, and others, for building sites. There was a high percentage of continuity¹ of small factory grounds (but a low percentage in large

¹At this juncture a number of terms need definition.

Continuity defined: Degree of uninterrupted of grounds by streets, public alleys, and railways (percentage ratio of uninterrupted main area of the plant's ground versus its total ground acreage).

Types of building-yard patterns defined: Solid, in which nearly all, or all, of the ground is covered by buildings (example, Fig. 3, H-10). Peripheral, in which the buildings are situated along the margins of the ground in such manner as to enclose, or, at least, to embrace the main yard (example, the block bounded by Eagle, Clark, First, and Second streets; Fig. 2, 1-9). Central, in which the buildings are centrally located in the grounds (example, Fig. 3, F-15). Lateral, in which the buildings are located on one side of the ground and the yard on the other side (example, Fig. 3, D-12). Heterogeneous, in which the building-yard pattern is a mixture (example, Fig. 3, H-4).

Types of buildings defined: Multiple-floor, in which less than 40 per cent of the ground floor of the buildings is of buildings which have but one story. Ground-floor, in which more than 59 per cent of the ground floor of the buildings is of buildings

grounds) due largely to the small size of factories downtown, but somewhat larger size near-downtown. The streets were uninterrupted by factory grounds, for the streets had become permanent before the first period of vigorous factory-growth. The building-yard pattern was chiefly of the solid type (nearly all of the factory ground was building-covered). The factories were chiefly of the multiple-floor type.

In the nineteen-thirties, roughly in the stage of late youth were the patterns of the following manufactural districts: the Northeastern, the Belt Line, most of the Joint Track, Pigeon Creek, and Illinois Central. Manufacturing entered these districts at different decades. The factories were numerous. Their grounds in size were less than one-half block more than a block, and intermediate. There was a high percentage of continuity within factory grounds, many of which were contiguous. There were numerous streets interrupted by factory grounds (except in the Joint Track, and parts of the Illinois Central, and Pigeon Creek). All five types of building-yard patterns were present. Exhibited also were all three types of factory building patterns, with emphasis upon the ground-floor type in the younger of these districts.

Illustrating factories in the infant stage of urban land-use pattern, were those of the Southwestern Manufactural District, and the peri-urban localities of Evansville. There were few factories; but they chiefly were large. There was almost total continuity within the factory-grounds. The streets were largely interrupted in favor of manufacturing. The buildings were predominantly ground-floor in type, and the building-yard patterns chiefly of the central type.

Alignment of Auxiliary Factories

Distributional association of auxiliary factories with the major factories whom they served constituted an important, although minor, distribution factor. Examples, as of 1933, were: Auxiliary to the furniture industry were plate-glass and mirror factories; mattresses and upholstering; boxes and crates; casters and other furniture-fixtures. Auxiliary to the cigar industry were cigar-box factories. With the breweries were associated

which have but one story.

TABLE 39

MANUFACTURAL DISTRICTS ANALYSIS^a

Items	Manufactural Districts								
	A	B	C	D	E	F	G	H	A-H
Gross acreage. . . .	203.0	101.0	82.0	127.0	121.0	131.0	337.0	211.0	1,313.0
Manufacturing grounds ^c									
Number	48	18	19	20	15	23	23	4	170
Total acreage. . . .	23.6	19.5	14.9	52.5	47.6	74.4	168.4	46.4	447.3
Average acreage. . .	0.5	1.1	0.8	2.6	3.2	3.2	7.3	11.6	2.6
Size, per cent of plants									
Less than:									
one-half block . . .	98	61	74	45	27	22	22	0	55
one-half to one. . .	4	39	26	30	27	48	26	0	24
more than one, unbroken	0	0	0	25	46	30	52	100	21
Continuity									
per cent complete	88	61	79	75	87	91	78	100	82
per cent of those incomplete. . . .	36	60	73	45	71	69	88	0	71
Railroad sidings, per cent with. . .	2	44	53	90	93	83	91	75	55
Manufacturing yards: grounds									
Per cent	35	46	28	71	61	65	68	82	65
Manufacturing buildings									
Type (per cent . . .	25	39	37	55	73	69	82	50	50
Ground-floor. . . .	65	39	53	45	27	22	9	50	41
Multiple-floor. . .									

Intermediate. . . .	10	22	10	0	9	0	9
Average floor space (acres).	0.7	1.4	1.0	1.3	1.6	3.3	1.4
Decades of manufactur- ing occupancy.	9	8	7	6	3	2	...

^aBased on primary information, for 1933.

^bIncludes District A' also.

^cDeveloped manufactural grounds.

^dPercentage of continuity of those plants which do not exhibit complete continuity of grounds.

cooperages. With the automobile and refrigerator plants were aligned producers of electric batteries, also metals, and enameled parts. However, there were some exceptions to the rule of proximity.

Section 3. Manufactural Districts

There were discernible manufactural districts. Eight are depicted as of the early nineteen-thirties (Fig. 16; Table 39). The chief basis of classification was decades of manufactural occupancy; but supporting criteria were utilized where pertinent, i.e., distribution of plants, internal unity, and individual distinctiveness.

District A.--Manufactural District A designates the Manufactural-Commercial District. It occupied, in 1933, substantially the same area as the Central Business District, with a gross area of approximately 203 acres, including A'. District A had nine decades of manufactural occupancy--in addition to two earlier decades of pioneer-manufacturing.

It had such internal unity as heterogeneous, small plants, almost all of which had unbroken grounds, and the firms of which responded to centripetal "forces." There were distinctive traits: (1) It was the oldest manufactural district, and the largest old one. (2) It exhibited the largest number of manufactories and categories; and (3) was the only district in which all of the nine manufactural Groups were represented. (4) District A ranked lowest in the average size of factory-grounds, in percentage of its plants having railroad sidings. (5) It contained the Ohio River wharf and the following terminals: Chicago and Eastern Illinois Railroad; electric street freight-railway; three interurban freight lines; finally, (6) it contained the hub of the city's bus and street-car lines.

District B.--This is the Lamasco-Evansville Manufactural District, occupying in gross space about 101 acres, after eight decades of manufactural occupancy.

It had such internal unity as: (1) harmony with its heterogeneous, urban land-use area, which evolved between the downtown cores of Lamasco and Evansville--a cluttered area; and (2) manufactural plants strongly encumbered with the past. Among its distinctive traits were: (1) the highest percentage of interrupted

factory grounds; (2) the railroad-river terminals, decades old, also the Louisville and Nashville Railroad depot; (3) pioneership in the development of numerous, rather "heavy" manufactories, also seniority in development beyond early downtown; and (4) retention of the most striking vestiges of manufacturing during the supremacy of conveyance via the Ohio River.

District C.--The Joint Track District comprised in gross, about 82 acres, after some seven decades of manufactural occupancy.

By the way of internal unity it had small factory-grounds strung along the Joint Track Railroad; a small percentage-ratio of yards versus factory grounds; and centrality of position between railroad terminals. By way of distinctive traits: (1) It was the smallest of the districts, and had the smallest total manufactural (not gross) acreage, i.e., about 15 acres. (2) It developed as the first peripheral district (now engulfed), and the pattern was in a stage of late youth upon the advent of the Joint Track. (3) It was the oldest "inland" district, with no dependence upon water transportation (except a small portion once served a short time by the Wabash and Erie Canal). Finally (4) it had the highest railroad centrality, for it connected three railroads, and had in it one depot, and was in close proximity to two others.

District D.--The Pigeon Creek District had six decades of manufactural occupancy, and comprised about 127 acres in gross.

For internal unity it had (1) historically the most close manufactural association with Pigeon Creek, and always potential high-water troubles; (2) largely wood-working plants and their auxiliaries; and (3) railroad sidings on 90 per cent of its factory-grounds. Some of its distinctive traits: (1) It was the oldest trans-creek manufactural district. (2) The southern portion was intimately associated with the mouth of Pigeon Creek, and with the Sweezer Pond depression (an old bayou of Pigeon Creek)--it was about six city blocks, including an island and a large pond, as shown in Figure 23, of great importance for reception and storage of logs. (3) District D was the oldest district with roomy grounds; and (4) it contained the (modern) Mead Johnson rail-river-truck terminal, one freight depot, and a coal mine.

District E.--The Illinois Central District, as of 1933, comprised in gross about 121 acres, and had experienced four decades of manufactural occupancy.

It exhibited such internal unity as: (1) railroad sidings on 93 per cent of its grounds; (2) roomy, rectangular grounds, many interrupting the streets, all strung along the railroad, on smooth land, separated from Pigeon Creek by a strip of gullied land partly subject to flood; (3) modern types of buildings, mostly ground-floor. It exhibited such distinctive traits as: (1) It ranked next to District D in concentrations upon wood-working, and otherwise concentrated chiefly upon textiles. (2) It contained the depot of the Illinois Central. (3) The northern portion was pocketed by Pigeon Creek and its flood-waters, and consequently that portion was embraced by low-class residence areas. (4) The district was poorly served by city street-transportation; and (6) it once contained a coal mine, and one was operating just north of its border.

District F.--The Belt Line District comprised in gross about 131 acres, after three decades of manufactural occupancy.

In internal unity: (1) It was the most solidly manufacturally developed district of Evansville, for more than half of its land was manufactural (about 74 acres). (2) It led in the item, percentage of plants with grounds from one-half block to one block in size (48 per cent). (3) It was one of the leading three districts in the item, streets interrupted in favor of manufacturing. Finally, (4) the plants concentrated upon wood, steel and food, some 83 per cent of which plants had railroad sidings. For distinctive traits it could claim that: (1) It was the center of the meat-packing and produce-processing industry of Evansville. (2) It was almost totally set off by park, creek, land subject to flood, and some residential land, and therefore would probably remain long a peripheral district. (3) It was well served by the Belt Line; and (4) had very little room for development of additional manufactural land, without striking modification of the urban land-use pattern.

District G.--The Northeastern Manufactural District comprised in gross, about 337 acres, and had seen two decades of manufactural occupancy (except the southern part, which is older).

The following traits helped to give it internal unity: (1) In 1929 it was the most modern manufactural district in Evansville. (2) Most of its plants were of the "heavy" manufacturing type. (3) About four-fifths of its manufactural wage earners

were in the steel-metal lines (and about one-tenth of them in wood-work), (4) There were numerous, large manufactural grounds, many of them adjacent; many of them interrupted the streets. (5) Four-fifths of the factories were of the ground-floor type. Finally, (6) some 91 per cent of the plants had railroad sidings. It found distinction in the following items: (1) It was the largest manufactural district in Evansville, and ranked second in percentage of land devoted to manufacturing. (2) It contained the largest three factories in the city, and employed about one-third of the manufactural wage earners. (3) It was unique in that most of its land had been held for industrial development (chiefly manufactural), and it led (among highly developed districts) in the degree to which its streets were interrupted for industry and railroads. (4) Finally, it was threaded by three railroads.

District H.--The Southwestern Manufactural District totaled, in gross, about 211 acres, and experienced two decades of manufactural occupancy.

Internal unity inherent in it included the following: (1) It was comprised of a few, large, roomy plants, each with complete continuity, scattered along the Louisville and Nashville Railroad, and the banks of the Ohio River. (2) A rather large portion of the district was subject to flood, because the terrace there is a bit low. (3) All of the grounds exceeded a block in size, and they interrupted streets. (4) Only one ground was without a railroad siding, and it (a saw-mill) fronted the Ohio River. (5) The district led in the item, percentage ratio of area of yards versus area of grounds, and it led in average floor-space per plant (3.3 acres). Among its traits of distinctiveness, as of 1933, were: (1) The district was the youngest. (2) It developed in an urban land-use pattern of infantile stage, and early-youth. (3) It led in ground ear-marked for future manufactural purposes.

Section 4. Availables for Expansion

Expansion within the manufactural districts, as of 1933, was possible (1) to a slight extent, with little modification of the land-use pattern; and (2) to a moderate extent, with large modification of the land-use pattern extant.

Expansion beyond the manufactural districts seemingly could be most readily accomplished toward the northeast where (1) the urban land-use pattern was youthful, (2) the land lay beyond the extant legal city-limits, and (3) the land was a continuation of the terrace.

There was potentiality in the decadent manufactural area (discussed in Chapter III), near the mouth of Pigeon Creek, in fact potentiality for park, or other civic center, as well as for manufacturing.

CHAPTER V

MANUFACTURAL TRADE PATTERNS

Because the ultimate goal of Manufactural Evansville is the profitable sale of the manufactured products, the manufactural sales pattern is the net result of everything treated in Chapters I-IV. The main problem is the delicate balance in kind and degree of the resource land, the manufacturing land, and the destination land. The basic elements in Chapter V are the trade pattern as a whole, the purchases pattern, the sales pattern, and the purchases-sales pattern in balance upon the fulcrum point which is Manufactural Evansville. The main two conclusions reached are that discernible order permeates the manufactural trade pattern, and that there is a predominance of factories with purchases-sales patterns favorable to success.

Section 1. Areal Coverage

Overall Pattern

The more-dense part of the overall pattern, as of the early nineteen-thirties, spread areally over much of the eastern part of the United States (Figs. 11 and 13). The coverage was best chiefly east of the Mississippi River. This was in line with (1) the great productivity and consumptivity of our country east of that river, and (2) its magnificent pattern of conveyance ways. It was in line, too, with (3) Evansville's location near the center of the population of the United States, and (4) her location a bit west of central in the Eastern United States. Pertinent, too, were the effects of (5) the Mississippi River as a freight breaking-line, and freight-rate breaking-line, combined with (6) Evansville's superior conveyance assets for trade east of the Mississippi-Missouri Rivers compared to her assets for trade west thereof.

The less-dense part of the overall pattern spread sparsely over the remainder of the country, and exhibited thin ribbons of

international trade. There was a thin coverage of national and quasi-national sales (as, for example, cake flour, refrigerators, health foods, and cigars). There was a minor, but important, mildly-dense fringe (chiefly sales) west of the Mississippi-Missouri Rivers, especially southwestward into Texas, and, also, a similar density in parts of the Pacific Coast. In the remainder of the territory between the Mississippi-Missouri Rivers and the Rocky Mountains, there were some small, isolated spots of less-sparse trade-coverage. In the overall coverage, there were wide blanks in the eastern highland regions, in the plateaus west of the Rockies, in the Atlantic Coastal Plain south of Baltimore, in southern Florida, and in New England.

Purchases and Sales Patterns

Relative extent.--The purchases pattern and the sales pattern of Manufactural Evansville were almost co-extensive east of the meridian of Duluth; but the sales pattern of this eastern part of the United States was somewhat the larger, especially westward and southwestward.

West of the meridian of Duluth the two patterns were not co-extensive. The supplies pattern was largely absent, but had some representation, especially in the lumbering areas of the Pacific Coast. The products pattern had more distinct representation, although it was sparse and spotty.

The Ohio River was an important line in both pattern areas. Throughout the evolution of Manufactural Evansville the majority source of supplies was north of the line of that river. Prior to the early nineteen-hundreds the majority destination of the manufactured products was south of that line (except in the incipient stage of Manufactural Evansville). The majority destination of manufactured products was north of the line by the early nineteen-thirties, and the realignment appeared to be a major one.

Texture.--The texture of the sales pattern was finer than that of the supplies pattern. Among related factors were the following: There were more points of destination than points of source. There were more items in the list of products than in the list of supplies (a list of such minutiae is available in Appendix I). In general, individual transactions in supplies were

larger than such transactions in products. There was more wholesaling in purchases than in sales. The potential sales-market was more varied and larger than the potential purchases-market. The sales organization (of Manufactural Evansville) was larger than the buying organization.

Anchorage and fixation.--The purchase pattern was more firmly fixed and anchored than the sales pattern. The supply pattern was firmly anchored in the Evansville Tri-State Area because that area furnished the Manufactural Component with almost all of its coal (and some gas). The products pattern had no comparable anchor; her sales in the Tri-State were but a small fraction of the whole. The location of the chief materials was largely fixed (hardwoods, iron and steels, leaf tobacco, soft wheat, animals for slaughter, etc.). In normal times it is more difficult to sell manufactured products than to buy manufactural materials; the pressure of such "sellers' market" tends to make the sales the less stable, and the more variable in areal detail.

Symmetry.--Evansville was more centrally located in its manufactural supplies area than in its overall sales area.

Persistence.--Both patterns persisted for decades, with few abrupt major changes. The basic assets of Manufactural Evansville have been durable, as have the tissues of her trade skeleton and organization.

Main Trade Province

The main trade province of Manufactural Evansville, in the early nineteen-thirties, extended from the Mississippi River to the Appalachian Mountains. The meridional axis was a bit east of Indianapolis. Evansville was centrally located in the province, although a trifle off-center--areally a strong position.

The texture of the patterns, "bought" and "sold," "whence," and "whither," and "what," was, in this main province, starry--a Milky Way, with numerous purchases and sales points, and many nucleiform centers (chiefly cities, such as Indianapolis, Louisville, St. Louis and Chicago; Detroit, Cincinnati, Nashville and Memphis; also Buffalo, Pittsburgh, Birmingham and New Orleans), as is revealed by Figures 11 and 13.

Section 2. Regional Distribution

For presentation of the regional distribution of the sources of supplies and the destinations of products, the regional areal units used herein are the territories of the railroad Freight Traffic Association (Fig. 34). They proved to be useful in tracing the growth of the manufactural trade pattern, for a number of reasons. (1) Inherent in each of them is a complex of significant geographical, historical, and economic traits which, combined, are related deeply to freight costs and the flow of trade, and which, consequently, are wont to strongly affect the trade pattern of the manufactural component of a city. (2) Although the trend is toward parity in freight rates, distance considered, that goal looms as yet afar. (3) These territories are regionally significant. For example, the territory of the Southern Freight Association is largely synonymous with the South, east of the Mississippi River; that of the Southwestern Freight Bureau, synonymous with the South, west of the Mississippi River; and that of the Central Freight Association, with the industrial portion of the North Central States; etc.

The estimated ranking of the freight territorial subdivisions in Manufactural Evansville's trade, as of the early nineteen-thirties, and as of earlier periods, is presented in Table 27. Minutia of supplies and purchases, and minutia of products and sales, by territories, are available in Appendix I.

At this juncture it is repeated that for decades the South led as Manufactural Evansville's chief market outlet; but by the thirties it had been surpassed by the North,¹ which had always led as the Component's chief source of supplies.

Such was the magnetism of the territory occupied by the American Manufactural Belt that the territory of the Central

¹Some of the major factors in her shift to the North as an outlet are recapitulated: (1) Rise of manufacturing in the South; (2) prolonged economic depression in the South; (3) loss of some of Evansville's river-gateway freight-rate advantages; (4) her gains in freight-rate relations in the North; (5) relative increase in the buying power of the North; and (6) Manufactural Evansville's shift toward less manufactural emphasis on materials and greater emphasis on products, which affected the manufactural increment, especially when viewed in terms of the manufacturing level.

Freight Association ranked first in the Evansville manufactural trade, both in supplies and in products (early nineteen-thirties). In addition, the territory of the Trunk Line Association, although distant, ranked third, in both counts.

Evansville's close manufactural trade-connections with the South (her location between the manufactural North and the agricultural South, and her access to both) is reflected in the fact that the territory of the Southern Freight Association ranked second, in both supplies and products. In addition, the territory of the Southwestern Freight Bureau ranked fourth, in both aspects.

The leadership of these subdivisions, Central Freight, and Southern Freight, was in line with Evansville's assets as a river gateway between both subdivisions, and her long enjoyment of freight rate advantages associated therewith.

Section 3. Bailiwick Pattern

Herein is presented an analysis of Manufactural Evansville's trade pattern by means of a device designated as the bailiwick, an analysis which emphasizes the item, distance, and reveals a number of correlations.

Explanation of the Term

By manufactural trade bailiwick area is meant the area of mainstay trade operations (mainstay sales, mainstay purchases) by a manufactural plant (and by a manufactural component)--the backlog area. It is the mainspring area, on which the firm can depend, year after year. In many instances such areas are areas of majority sales and, or, purchases. During the great depression of the early 1930's many of the Evansville manufactural firms became sharply conscious of such areas.

Concerning each of almost all of the firms the author prepared a map (unpublished) depicting the manufactural trade pattern (purchases and sales), also a map depicting the bailiwick areas. From a study of these data was prepared a map depicting five generalized bailiwick areas. The sales bailiwick area of a given firm is in one of these five generalized bailiwick areas; ditto the purchases bailiwick area of a given firm. These generalized manufactural trade bailiwick areas are as follows: (1) Evansville

plus its Tri-State Area;¹(II) Neighborhood States; (III) the Intermediate States; (IV) the Distant States; and (v) the National and Quasi-National bailiwick. In order, each of these five bailiwicks represents distance, increasingly great, from Evansville; they are quasi-concentric. In behalf of brevity, Bailiwick I, at places, is designated by the symbol, A; Bailiwick II, B; Bailiwick III, C; Bailiwick IV, D; and Bailiwick V, E.

This generalized manufactural trade bailiwick pattern was found to be useful in analyzing Evansville's manufactural trade pattern, especially in the search for correlations and order therein.

Prior to presentation of such findings, it is useful, at this juncture, to digress, briefly, into explanation of procedure.

In the study of the manufactural trade of Evansville a large amount of data was obtained in terms of dollar volume, and in terms of tonnage. But it was found to be impracticable, in this treatise, to assemble and manipulate these data one hundred per cent. However, these dollar and tonnage data proved to be valuable as checks.

It was found to be more practicable, in this treatise, to assemble and manipulate data in terms of the number of plants, and the number of manufactural wage earners (not employees such as office force and sales force) employed therein. The items, number of plants and number of manufactural wage earners, proved to be valuable indices (as has been cited in a previous chapter).

In gross, the manufactural trade was found to be roughly commensurate with the number of plants, and the number of manufac-

¹The states in each of the bailiwicks are as follows:

- (I) Evansville and its Tri-State Area: as in Figure 12.
- (II) Neighborhood States: Indiana, Illinois, western Kentucky, western Tennessee, i.e., the four states as described, minus Evansville and its Tri-State Area.
- (III) Intermediate States: Southern Michigan, Wisconsin and Minnesota; plus Iowa, Missouri, Arkansas, Louisiana, Mississippi, Alabama, Georgia; plus western North Carolina, South Carolina, Pennsylvania and New York; plus eastern Kentucky and Tennessee; plus Virginia and Ohio. These states constitute a zone around the Neighborhood States.
- (IV) Distant States: They are the states beyond the Intermediate States.
- (V) National and Quasi-National bailiwick: This refers to the entire country, or largely that. Firms which have national distribution utilize essentially the entire country. Firms which have quasi-national distribution utilize a large part of the country.

tural wage earners, with minor exception. In terms of percentage for comparison, these indices proved to be fairly reliable, and highly useful. For example, a city with ten furniture plants, employing a total of 1,000 manufactural wage earners, rates, in the furniture-world, roughly about twice that of a city with five furniture plants, employing a total of 500 manufactural wage earners.

In these comparative studies, in general, the trade in terms of the number of plants emphasized the role of the smaller factories, whereas the trade in terms of the number of manufactural wage earners emphasized the role of the larger factories. In general the truth of the comparison lay somewhere between the two findings (findings in terms of percentage of plants, and findings in terms of the number of manufactural wage earners).

The use of these bailiwicks, indices, and procedures will be clarified in the following paragraphs concerning correlations and order in the bailiwick manufactural trade.

Correlations and Order

General pattern.--Herein is presented the general bailiwick manufactural trade pattern of Manufactural Evansville, as of the early nineteen-thirties. The bailiwick pattern is that of the Manufactural Component as a whole, for it presents a composite of almost all of the plants (186), in total, not broken down: the pattern for all of the products, the pattern for all of the materials, and the pattern for all of the fuel and purchased electric energy (Table 40). It is the overall bailiwick pattern for essentially all industries, in total. The findings follow.

Bailiwick I¹ (Evansville plus its Tri-State Area) led overwhelmingly as a source of fuel and purchased electric energy.

The leading two bailiwicks in combined trade, i.e., total purchases of materials (not including fuel and electricity) by Manufactural Evansville, plus total sales of manufactured products by Manufactural Evansville, were the bailiwicks II² and III.³ More-

¹That is to say: A. That is to say: Evansville plus its Tri-State Area.

²That is to say: B. That is to say: the Neighborhood States.

³That is to say: C. That is to say: the Intermediate States.

TABLE 40
GENERAL BAILLIWICK PATTERN^a

Manufactural Evansville	Manufactural Trade Bailliwicks ^b				
	I	II	III	IV	V
Sale of products ^c					
A.	81	61	28	13	4
B.	44	32	15	7	2
X.	11	41	26	7	15
Purchase of materials ^d					
C.	34	71	77	8	0
D.	18	37	40	5	0
X.	8	12	63	17	0
Purchase of fuels, elec- tricity ^d					
C.	186	0	1	0	0

^aThe data are based upon some 200 unpublished maps, each depicting the manufactural trade pattern of a factory. The maps are based upon information obtained by questionnaires and other interviews, from newspaper reports and sales catalogs, and from Federal data. These same maps are the chief source of data for Tables 40-48.

^bThe bailliwicks, which are similarly designated in Tables 40-48, are:

- I, Evansville plus its Tri-State Area.
- II, The Neighborhood States.
- III, The Intermediate States.
- IV, The Distant States.
- V, National and Quasi-National.

^cHerein the symbol, A, means: Number of plants with mainstay sales in the bailliwick. Likewise, the symbol, B, means: Percentage of all plants with mainstay sales in the bailliwick. Likewise, the symbol X, means: Percentage ratio of their manufactural wage earners to all manufactural wage earners of Evansville.

^dHerein the symbol, C, means: Number of plants with mainstay purchases in the bailliwick. Likewise, the symbol, D, means: Percentage of all plants with mainstay purchases in the bailliwick. The symbol, X, is used as in note c.

Table 40 presents the classification of manufactural plants of Evansville by bailliwicks (back-log areas), as of 1933. For further description of the table, turn to Appendix II.

over, together they accounted for a majority of the total bailliwick trade of Evansville (not counting fuel and electricity, for, in these analyses, those two items are excluded from the item, materials--but they are included in the item, supplies). It is inferen-

tially concluded that likewise they accounted for a majority of the total trade of Manufactural Evansville.

Similarly, bailiwick I held a firm secondary position. Bailiwick IV (Distant States), a poor tertiary position; and bailiwick V (National and Quasi-National) ranked last, mainly because Manufactural Evansville made in it no bailiwick purchases of material.

Partly complete explanation of the preceding basic bailiwick pattern is as follows: Bailiwick I is firm in its secondary position because of nearness, and ready access to, local consumptivity and productivity, and because of its relatively small competition from competitors afar (due to the distance factor). But bailiwick I is limited by its size and population, and therefore could not achieve first place. Bailiwicks II and III are the highest two largely due to (1) relatively low freight costs in line with relatively short distance of shipment; (2) high productivity and consumptivity; and (3) the existence of certain essential materials therein used in large quantities by Manufactural Evansville, e.g., irons and steels, hardwoods, and soft wheat. The element of distance worked against bailiwicks IV and V.

A comparison of the performance of Manufactural Evansville in purchases of materials and sales of products in the bailiwicks is also informative. The leading two bailiwicks in sales were I and II; but the leading two bailiwicks in purchases were II and III. That is to say, Manufactural Evansville went farther afield for the bulk of its purchases of materials than for the bulk of its sales, largely because the aforementioned essential materials could not be obtained elsewhere both in fact and advantageously. The lowest ranking two bailiwicks, in sales and in purchases of materials, were IV and V, largely because of distance.

Pattern of the Groups.--Herein the general pattern as of preceding topic, is presented broken down into the nine manufactural Groups. The classification of the manufactural trade is by the nine manufactural Groups and the five bailiwicks, for purchases of materials, and for sales of products--a breakdown into eighteen patterns (Tables 41 and 42). They reflect the manufactural trade patterns of the manufactural Groups, as of the early nineteen-thirties.

In purchases of materials, it is apparent that the food

TABLE 41
PURCHASES PATTERNS BY GROUPS^a

Manufactural Groups	Purchases Balliwicks, Except Fuel ^b			
	I	II	III	IV
1. Wood ^c				
A.	16.00	24.00	45.00	0.00
B.	8.50	25.40	66.10	0.00
X.	15.00	18.00	39.00	0.00
Y.	4.10	8.00	87.90	0.00
Z.	1.10	2.10	24.20	0.00
2. Metals and alloys ^c				
A.	0.00	15.00	37.00	10.00
B.	0.00	26.20	71.40	2.80
X.	0.00	15.00	55.00	0.74
Y.	0.00	4.90	94.60	0.50
Z.	0.00	1.80	34.3	0.10
3. Tobacco (cigars)				
A.	0.00	0.00	0.00	40.00
B.	0.00	0.00	0.00	100.00
X.	0.00	0.00	0.00	93.00
Y.	0.00	0.00	0.00	100.00
Z.	0.00	0.00	0.00	16.60
4. Food materials				
A.	39.00	15.00	1.00	0.00
B.	50.00	48.50	4.20	0.00
X.	69.00	19.00	0.26	0.00
Y.	67.20	30.60	2.20	0.00
Z.	5.00	2.3	0.20	0.00
5. Stone, sand, clay, coal				
A.	29.00	7.00	5.00	20.00
B.	45.00	25.00	20.00	10.00
X.	13.00	11.00	3.00	1.00
Y.	24.70	31.80	40.20	3.30
Z.	1.00	1.20	1.60	0.10
6. Textiles, cloth, leather				
A.	0.00	9.00	2.50	30.00
B.	0.00	58.30	16.7	25.00
X.	0.00	16.00	2.00	6.00
Y.	0.00	47.60	24.60	27.80
Z.	0.00	1.90	1.00	1.20
7. Paper, printing materials				
A.	3.00	18.00	2.50	0.00
B.	6.30	81.20	13.50	0.00
X.	1.00	7.00	0.40	0.00
Y.	8.50	71.90	19.60	0.00
Z.	0.10	0.90	0.20	0.00

TABLE 41--Continued

Manufactural Groups	Purchases Bailiwicks, Except Fuel ^b			
	I	II	III	IV
8. Chemicals				
A.	3.00	2.00	2.00	0.00
B.	20.00	40.00	40.00	0.00
X.	0.40	0.40	0.40	0.00
Y.	8.70	15.20	76.10	0.00
Z.	0.02	0.04	0.20	0.00
9. Other materials				
A.	10.00	9.00	4.00	0.00
B.	23.00	54.00	23.00	0.00
X.	2.00	14.00	1.00	0.00
Y.	6.40	67.30	26.30	0.00
Z.	0.10	1.70	0.60	0.00

^aData based largely upon some 200 unpublished maps, as in Table 40.

^bBailiwicks are designated as in Table 40.

^cHerein the symbol, A, means: Percentage of plants of the column. Likewise, the symbol, B, means: Percentage of the plants of this Group. Also, the symbol, X, means: Percentage of manufacturing wage earners of the column. Likewise, the symbol, Y, means: Percentage of manufacturing wage of this Group. Likewise, the symbol, Z, means: Percentage of manufacturing wage earners of all plants.

Table 41 presents a classification of manufacturing plants, by Groups and by purchases bailiwicks, as of 1933. Purchases of fuels are excluded because they were almost wholly from mines near Evansville. For further discussion of the table, turn to Appendix II.

Group and stone-sand-clay Group bailiwicked in A (Evansville plus its Tri-State Area), largely because of the area's productivity in animals, milk and other produce, canning produce, soft wheat, building stone, sand, brick, clays, etc. On B focussed the Groups: paper-printing-publishing and textiles-clothing-leather, mainly due to the productivity-consumptivity and nearness of B. The main resourceland for the Groups, wood, and metals-alloys was C--elsewhere these essential materials could not be obtained in large quantities both in fact and advantageously. The mainstay purchases of the tobacco Group (for cigars), and of the chemicals, was D, because it was the least distant source of the leaf tobaccos, and in accordance with the scattered materials for paints, largely distant.

TABLE 42
SALES PATTERNS BY GROUPS^a

Manufactural Groups ^c	Sales Bailiwicks ^b				
	I	II	III	IV	V
1. Wood					
A.	21.00	41.00	23.00	62.00	0.00
B.	25.00	47.00	15.00	13.00	0.00
X.	22.00	30.00	34.00	71.00	0.00
Y.	7.00	43.00	31.00	18.00	0.00
Z.	2.07	12.55	8.94	5.20	0.00
2. Metals and alloys					
A.	11.00	28.00	28.00	15.00	50.00
B.	19.00	45.00	26.00	5.00	5.00
X.	16.00	33.00	39.00	11.00	63.00
Y.	4.00	37.00	29.00	3.00	27.00
Z.	1.45	13.51	10.36	0.81	9.38
3. Tobacco (cigars)					
A.	0.00	3.00	2.00	0.00	25.00
B.	0.00	50.00	25.00	0.00	25.00
X.	0.00	29.00	1.00	0.00	27.00
Y.	0.00	73.00	2.00	0.00	25.00
Z.	0.00	12.00	0.33	0.00	4.65
4. Food materials					
A.	21.00	3.00	13.00	8.00	25.00
B.	63.00	8.00	21.00	4.00	4.00
X.	34.00	1.00	6.00	7.00	10.00
Y.	43.00	7.00	23.00	7.00	20.00
Z.	3.16	0.53	1.69	0.53	1.48
5. Stone, sand, clay, coal					
A.	17.00	8.00	7.00	0.00	0.00
B.	60.00	25.00	15.00	0.00	0.00
X.	11.00	1.00	9.00	0.00	0.00
Y.	27.00	15.00	58.00	0.00	0.00
Z.	1.05	0.59	2.30	0.00	0.00
6. Textiles, cloth, leather					
A.	0.00	6.00	15.00	15.00	0.00
B.	0.00	33.00	50.00	17.00	0.00
X.	0.00	3.00	7.00	11.00	0.00
Y.	0.00	31.00	49.00	20.00	0.00
Z.	0.00	1.25	1.98	0.7	0.00
7. Paper, printing materials					
A.	20.00	3.00	0.00	0.00	0.00
B.	38.00	12.00	0.00	0.00	0.00
X.	11.00	.30	0.00	0.00	0.00
Y.	89.00	11.00	0.00	0.00	0.00
Z.	1.04	0.13	0.33	0.00	0.00

TABLE 42--Continued

Manufactural Groups ^c	Sales Bailiwicks ^b				
	I	II	III	IV	V
8. Chemicals					
A.	2.00	4.00	2.00	0.00	0.00
B.	20.00	60.00	20.00	0.00	0.00
X.	0.30	0.60	0.10	0.00	0.00
Y.	9.00	80.00	11.00	0.00	0.00
Z.	0.03	0.13	0.03	0.00	0.00
9. Other materials					
A.	8.00	4.00	10.00	0.00	0.00
B.	46.00	23.00	31.00	0.00	0.00
X.	6.00	2.00	4.00	0.00	0.00
Y.	22.00	33.00	45.00	0.00	0.00
Z.	0.51	0.79	1.09	0.00	0.00

^aData based largely upon some 200 unpublished maps, as in Table 40.

^bAs in Table 40.

^cSymbols herein have meaning as in Table 41.

Table 42 presents classification of manufacturing plants by Groups and by sales bailiwicks, as of 1933. For further description of the table, turn to Appendix II.

In sales, it is apparent that three Groups bailiwicked outstandingly in A, namely food, stone-sand-clay, and paper-printing-publishing, all-in-all in line with local needs, and weakened competition from afar because of distance and time. Four Groups stressed B, i.e., wood, metals-alloys, cigars, and chemicals. Furniture factories were numerous and distributed widely, and thus competition in distant sales was keen (but scarcely effectively-keen for special furniture, like office furniture). Other pertinent factors for the B set-up precedingly cited: (1) Great consumptivity for agricultural machinery, power engines for farm; (2) bulky structural manufacturing materials, and mining equipment; (3) outlets for which some of the factories were satellites (mail order houses, great department stores like Marshall Field, chain stores); and (4) relative nearness versus freight costs and time. The Group, textiles-clothing-leather, fared best in C (although strong also in B and D), in line with suits, also gear for mules, in the South; and in line with awnings and low price-class clothing, in cities. The miscellaneous Group, due to its diversity,

exhibited bailiwick diversity.

Pattern of the categories.--Herein the general pattern is broken down to another, and more-subdivided level, the category-level. The classification of the manufactural trade is by more than fifty (56) categories, in purchases, and in sales--constituting upwards of a hundred patterns (Tables 43 and 44). These bailiwick trade-patterns reflect the manufactural trade-patterns of the Evansville categories.

Detailed analysis of this century of patterns, as individuals, is herein courteously omitted. But they have been rebuilt into ten arrays of category patterns sharply significant, and capable of brief findings--summation in terms of distance of trade.

In purchases, it is apparent that there was an array of categories (12) almost all of the plants of which bailiwicked in purchases materials locally (i.e., in bailiwick area I; that is, in A; that is, in the Evansville Tri-State Area). They constituted some 86 per cent of all of the Evansville manufactural plants which did so; and also, they employed about 83 per cent of the manufactural wage earners of such plants, which employance amounted to about one-twentieth of all of the manufactural wage earners of Evansville. They are the Evansville type (sample, or illustration) of the category almost all of the plants of which bailiwick in purchases locally. Examples: bricks, creameries, canning, and meat-packing. There was a second array of categories (14) almost all of the plants of which stressed purchased in B. They constituted about 55 per cent of the Evansville plants which did so; and employed about 67 per cent of the manufactural wage earners of such plants; which employance was about one-twelfth of the total manufactural wage earners of Evansville. Examples: Printing-publishing, wholesale-bakeries, and glass bottles. Similarly, a third array (15 categories), bailiwicked in bailiwick area III, with furniture and agricultural machinery as examples. Similarly a fourth array of two categories (cigars, tents-awnings) fared best in D. Finally, a fifth, heterogeneous, array (12 categories) emphasized various purchases-bailiwicks for each category--examples being: foundries, monuments and cut-stone, planing-mills, and candy. The chief findings is that, in the first four arrays, the element of distance was highly important in the makeup of the purchases patterns.

TABLE 43
PURCHASES PATTERNS BY CATEGORIES^a

Arrays of Categories	Number of Manufacturing Plants by Purchases Bailiwicks (Fuel Excluded) ^b			
	I	II	III	IV
Bricks, tile.	4	0	0	0
Canning	1	0	0	0
Concrete products	3	0	0	0
Dairies, creameries, ice cream	6	0	0	0
Electric power.	2	0	0	0
Flour mills	5	2	0	0
Ice plants.	3	0	0	0
Paper mill.	1	0	0	0
Produce-packing	1	0	0	0
Railroad ties, treated.	1	0	0	0
Slaughtering, packing	4	0	0	0
Vinegar	1	0	0	0
Subtotal ^c				
A.	32.0	2.0	0	0
B.	86.0	3.0	0	0
X.	83.0	1.0	0	0
Y.	5.8	0.2	0	0
Bakeries, wholesale	0	7	0	0
Breweries	0	2	0	0
Brooms.	0	3	0	0
Clothing.	0	3	0	0
Coffins	0	1	0	0
Cooperage	0	3	0	0
Gas	0	1	0	0
Glass, bottles.	0	1	0	0
Leather, harness.	0	2	0	0
Malleable iron.	0	1	0	0
Mattresses.	0	2	0	0
Patent medicine, etc.	1	2	0	0
Pharmaceuticals, diets.	0	1	0	0
Printing, publishing.	0	13	2	0
Subtotal				
A.	1.0	42.0	3.0	0
B.	3.0	55.0	4.0	0
X.	2.0	69.0	1.0	0
Y.	0.2	8.3	0.8	0
Agricultural machinery, tools	0	0	3	0
Architectural, structural and ornamental iron and steel; scaffolding.	0	1	3	0
Automobiles, bodies, parts.	0	0	3	0
Bottle caps	0	0	1	0
Casters, furniture fixtures	0	0	1	0
Coffee, spices (wholesale).	0	0	3	0
Electrical implements	0	0	2	0
Excavating machinery.	0	0	1	0

TABLE 43--Continued

Arrays of Categories	Number of Manufacturing Plants by Purchases Bailiwicks (Fuel Excluded) ^b			
	I	II	III	IV
Furniture, radio cabinets. . .	0	4	24	0
Metal-stampings and work . .	0	0	3	0
Paints, varnishes.	0	0	2	0
Pottery and vitreous ware. . .	0	0	2	0
Refrigerators.	0	0	1	0
Stoves	0	0	4	0
Wagon parts.	0	0	1	0
Subtotal				
A.		0	5.0	0
B.		0	6.0	0
X.		0	6.0	0
Y.		0	0.7	0
Cigars	0	0	0	4
Tents, awnings, etc.	0	0	0	1
Subtotal				
A.		0	0	5.0
B.		0	0	50.0
X.		0	0	95.0
Y.		0	0	17.1
Bathroom tanks, seats. . . .	0	1	2	0
Boxes, crates, cases	2	1	2	0
Candy, confectioneries	0	1	1	0
Enameling, metal plating . . .	0	2	2	0
Foundries, machinist work . .	0	1	2	1
Hand tools	0	1	1	0
Machinery, engines, parts. . .	0	6	2	0
Mirror plating	0	2	1	0
Monuments and cut-stone. . . .	0	2	0	2
Planing-mills.	0	6	2	0
Saw mills, veneer-mills. . . .	2	1	1	0
Textiles	0	1	1	2
Subtotal				
A.		4.0	25.0	17.0
B.		11.0	36.0	23.0
X.		15.0	24.0	21.0
Y.		1.0	2.9	13.4

^aData based largely upon 200 unpublished maps, as in Table 40.

^bBailiwicks are designated as in Table 40.

^cHerein the symbol, A, means: Number of plants. Likewise the symbol, B, means: Percentage of column. Also, the symbol, X, means: Percentage of manufactural wage earners of this column. Likewise, the symbol, Y, means: Percentage of manufactural wage earners of total.

Table 43 presents a classification of manufactural plants by categories and by purchases bailiwicks, as of 1933. For further description of the table turn to Appendix II

TABLE 44
SALES PATTERNS BY CATEGORIES^a

Arrays of Categories	Number of Manufacturing Plants by Sales Balliwick ^b				
	I	II	III	IV	V
Bakery, wholesale.	7	0	0	0	0
Boxes and crates	5	1	0	1	0
Coffee, spices	3	0	0	0	0
Concrete products.	3	0	0	0	0
Cooperages	3	0	0	0	0
Dairies, creameries, ice cream	6	0	0	0	0
Electric power.	2	0	0	0	0
Enameling, metal-plating	2	2	0	0	0
Gas.	1	0	0	0	0
Ice.	1	0	0	0	0
Malleable iron castings. . . .	3	0	0	0	0
Mirror plating	3	0	0	0	0
Monuments and cut-stone. . . .	4	0	0	0	0
Planing-mills.	7	0	0	0	0
Printing, publishing	14	1	0	0	0
Slaughtering, meat-packing	5	0	0	0	0
Vinegar.	1	0	0	0	0
Subtotal ^c					
A	70.0	4.0	0	1.0	0
B	85.0	7.0	0	8.0	0
X	87.0	1.0	0	15.0	0
Y	9.0	0.4	0	0.7	0
Bottle caps.	0	1	0	0	0
Breweries.	0	2	0	0	0
Candy, confectionery	0	2	0	0	0
Coffins.	0	1	0	0	0
Electrical implements.	0	2	0	0	0
Furniture, radio cabinets. . . .	0	20	4	4	0
Paper.	0	1	0	0	0

TABLE 44--Continued

Arrays of Categories		Number of Manufacturing Plants by Sales Bailiwicks ^b				
		I	II	III	IV	V
Produce-packing.		0	1	0	0	0
Paints, varnishes.		0	2	0	0	0
Mattresses.		0	2	0	0	0
Metal stampings, etc.		1	1	0	0	0
Railroad ties, treated.		0	1	0	0	0
Wagon parts.		0	1	0	0	0
Bricks, tile.		2	2	0	0	0
Subtotal						
A.		3.0	39.0	4.0	4.0	0
B.		4.0	58.0	13.0	30.0	0
X.		5.0	38.0	6.0	31.0	0
Y.		0.5	17.1	1.5	1.4	0
Agricultural implements.		0	1	2	0	0
Automobile bodies and parts.		0	0	4	0	0
Casters, furniture fixtures.		0	0	1	0	0
Glass, bottles.		0	0	1	0	0
Stoves.		0	1	3	0	0
Tents, awning, etc.		0	1	1	0	0
Clothing.		0	3	1	0	0
Subtotal						
A.		0	5.0	13.0	0	0
B.		0	5.0	13.0	0	0
X.		0	3.0	79.0	0	0
Y.		0	1.2	19.1	0	0
Canning.		0	0	0	1	0
Subtotal						
A.		0	0	0	1	0
B.		0	0	0	1	0
X.		0	0	0	8	0
Y.		0	0	0	12	0
					0.5	0

TABLE 44--Continued

Arrays of Categories	Number of Manufacturing Plants by Sales Bailiwicks ^b				
	I	II	III	IV	V
Pharmaceuticals, diets.	0	0	0	0	1
Excavating machinery.	0	0	0	0	1
Refrigerators.	0	0	0	0	1
Subtotal					
A.	0	0	0	0	3.0
B.	0	0	0	0	78.0
X.	0	0	0	0	73.0
Y.	0	0	0	0	11.3
Architectural, structural and ornamental iron and steel; steel scaffolding; etc.	0	2	0	1	0
Bathroom seats, basins, tanks.	0	2	0	1	0
Brooms.	0	1	1	0	0
Cigars.	0	3	0	0	1
Textiles.	0	0	2	0	0
Flour mills.	2	1	3	0	0
Hand tools.	0	1	0	1	0
Leather, harness.	0	1	1	0	0
Machinery, engines, parts.	4	1	1	1	0
Patent medicines, etc.	1	1	1	0	0
Pottery, vitreous ware.	0	1	1	0	0
Saw and veneer mills.	0	2	1	0	0
Foundries, machine shops.	2	1	0	1	0
Subtotal					
A.	9.0	18.0	13.0	7.0	1.0
B.	11.0	28.0	45.0	54.0	25.0
X.	8.0	58.0	15.0	42.0	27.0
Y.	0.8	25.9	3.8	1.9	4.2

^aData based largely upon some 200 unpublished maps, as in Table 40.^bBailiwicks as in Table 40.^cSymbols under item, Subtotal, as in Table 43.

In the sales pattern, the element of distance was also highly important, for five arrays of categories. There was an array of 18 categories, e.g., wholesale-bakeries, whose sales bailiwick was area I; and whose plants constituted about 85 per cent of all such plants. Corresponding figures for a second array were: 13 categories, furniture, area II, 59 per cent. Ditto for a third array: 7 categories, automobile-bodies and parts, area III, 42 per cent. Ditto for a fourth array: 1 category, canning, area IV, 10 per cent. Ditto for a fifth array: 3 categories, excavating-machinery, area V, 73 per cent. Finally there was a sixth, heterogeneous array, of 14 categories, with various sales bailiwicks for each category.

This juncture marks the close of the analysis of the general trade pattern, and its break-down into Group-patterns, and category-patterns. The chief finding was that there is discernible alignment in terms of distance. Such a conclusion might have been postulated; but the preceding analysis presented evidence, in mathematically-manipulative form. Similar analysis turns, next to other phases of correlation.

Pattern vs. size of plants.--The trade pattern was related to the size of the manufactural plants, as is concluded from the findings in the analysis of bailiwick trade according to the size of the plants, in Table 45. In the classification by bailiwicks and size of plants, the larger plants ranged the farther afield in the trade pattern, with small exception. The smaller plants stressed bailiwick purchases in the Neighborhood States and, to a less extent, locally; also, they stressed bailiwick sales locally; and, to a less extent, in the Neighborhood States. But the larger plants emphasized purchases in the Intermediate States, and, to a less extent, beyond; also, they emphasized bailiwick sales in the Neighborhood States, and beyond. The very large plants ranged even farther afield. Analysis in terms of the manufactural wage earners was concordant with the preceding, with small exception.

Evidently the extent of the Evansville manufactural trade pattern was related, in part, to the size of the plants.

Pattern vs. plant-ownership.--There was also a seemingly discernible relationship between distance of trade and plant ownership (intra-Evansville versus extra-Evansville), as shown by Table 46.

TABLE 45
PATTERN VS. SIZE^a

Factory Size ^c	Manufactural Trade Bailiwicks ^b				
	I	II	III	IV	V
0-25 employance ^d					
A.	21	50	26	3	0
B.	65	25	6	4	0
X.	23	43	31	3	0
Y.	55	32	8	5	0
0-50					
A.	20	43	34	3	0
B.	57	31	9	3	0
X.	19	30	47	4	0
Y.	40	43	15	2	0
0-100					
A.	20	40	38	2	0
B.	50	32	12	6	0
X.	17	27	54	2	0
Y.	28	39	20	13	0
Exceeding 100					
A.	7	11	71	11	0
B.	4	46	25	14	11
X.	4	6	67	23	0
Y.	3	43	27	7	20
26-50					
A.	16	23	58	3	0
B.	29	52	19	0	0
X.	15	20	61	4	0
Y.	26	53	21	0	0
51-100					
A.	19	23	58	0	0
B.	19	35	23	23	0
X.	16	23	61	0	0
Y.	16	34	25	25	0
101-250					
A.	5	15	75	5	0
B.	0	55	25	20	0
X.	4	18	73	4	0
Y.	0	47	30	23	0
251-500					
A.	50	0	50	0	0
B.	50	0	0	0	50
X.	43	0	57	0	0
Y.	43	0	0	0	57
Exceeding 500					
A.	0	0	67	33	0
B.	0	34	33	0	33
X.	0	0	65	35	0
Y.	0	46	29	0	25

^aData based largely upon some 200 maps, as in Table 40.

^bBailiwicks as in Table 40.

^cAccording to employance of manufactural wage earners.

^dThe symbol, A, means: Percentage of such plants stressing the bailiwick in purchases. Likewise the symbol, B, means sales. The symbol, X, means: Percentage of such earners in such plants stressing the bailiwick in purchases. Likewise the symbol, Y, means sales.

Table 45 presents the manufactural trade patterns by bailiwick and by size of plant, as of 1933. For further description of the table, turn to Appendix II.

TABLE 46
PATTERN VS. OWNERSHIP^a

Manufactural Plant Ownership	Manufactural Trade Bailiwicks ^b				
	I	II	III	IV	V
Owned intra Evansville ^c					
A.	18	35	42	3	0
B.	42	39	11	7	1
X.	7	16	56	21	0
Y.	12	59	15	11	3
Owned extra Evansville ^c					
A.	30	15	40	15	0
B.	10	20	50	5	15
X.	10	6	72	12	0
Y.	5	23	40	1	31

^aData based largely upon 200 unpublished maps, as in Table 40; also upon data as to ownership, obtained by questionnaires, financial reports, and business annuals.

^bBailiwicks are designated as in Table 40.

^cHerein the symbol, A, means: Percentage of such plants stressing the bailiwick in purchases. Likewise, the symbol, B, means: Percentage of such plants stressing the bailiwick in sales. Also, the symbol, X, means: Percentage of manufactural wage earners of such plants stressing the bailiwick in purchases. Likewise the symbol, Y, refers to their percentages in sales.

Table 46 presents a classification of the manufactural trade patterns, by bailiwicks and by type of ownership of the plants, i.e., intra Evansville and extra Evansville ownership, as of 1933. The item, fuel, is excluded. For further description of the table, turn to Appendix II.

In the classification by bailiwick and plant-ownership, the extra-Evansville owned plants ranged the farther afield in the trade pattern. Such ownership stressed rather distant-sales and medium-distance purchases (except fuels and electricity), whereas the intra-Evansville ownership stressed medium distance,

in purchases, and less-distance, in sales.

In terms of number of plants, 55 per cent of the extra-Evansville owned plants bailiwicked beyond the Neighborhood States in purchases, and 70 per cent in sales. Corresponding figures for the other type of ownership, were: 53 per cent in purchases in the local area and the Neighborhood States, and 81 per cent in sales. In terms of number of manufactural wage earners, the corresponding two sets of figures were: beyond B, 84 per cent, 72 per cent; in A and B, 23 per cent, 71 per cent.

It may be that this relationship was partly coincidental, because chiefly the larger plants were represented in extra-Evansville ownership and financial control.

Pattern vs. rawness of materials.--Was the relative distance of trade purchases (fuel and electricity excluded) in line with raw materials versus manufactured materials? Probably true, although it was masked by the fact that Evansville tobacco materials were obtained distantly--the tobacco factories remained at Evansville for other reasons than nearness of materials.

The raw materials constituted about one-third of all of the materials purchased by Manufactural Evansville. About 59 per cent (Table 47) of the plants utilizing almost exclusively unmanufactured materials bailiwicked in area I in their purchases. They were chiefly small plants, and a few large plants such as flour-mills (in which the volume of trade is large compared to the number of manufactural wage earners), and therefore the corresponding percentage of manufactural wage earners was only about 27. The bailiwick purchases of manufactured materials was farther afield, with minor exception.

Pattern vs. freight-rate height?--How about correlation of freight-rate heights and distance of manufactural trade? A thorny question, answered reluctantly (probably untraditionally), "Seemingly non-discernible; little, if any." The steps to this answer were long and involved, and in large measure are herein considerably omitted; but explanational gist follows.

The freight of Manufactural Evansville, as of the early nineteen-thirties, was classified under five generalized freight-rate Groups devised for the problem (these freight-rate Groups were introduced in Table 4, and described in brief detail in Chapter I). That is to say, the freight purchases of a factory (1) were manip-

TABLE 47

PATTERN VS. RAW MATERIALS^a

Purchases in Terms of Plants and Manufactural Wage Earners	Percentage of Mainstay Purchases of Materials (except Fuel) from Bailiwick Areas ^b							
	Unmanufactured Materials				Manufactured Materials			
	I	II	III	IV	I	II	III	IV
In terms of plants ^c								
A.	59	24	6	11	..	..	..	..
B.	..	..	..	..	0	41	58	1
In terms of manufac- tural wage earners ^c								
X.	27	14	4	54	..	..	..	..
Y.	..	..	..	..	0	11	89	1

^aData based largely upon primary information, and some 200 unpublished maps as in Table 40.

^bBailiwicks are designated as in Table 40.

^cHerein the symbol, A, means: Percentage of plants stressing the bailiwick and utilizing almost exclusively unmanufactured materials. Likewise the symbol, B, refers to manufactured materials. Also, the symbol, X, means: Percentage of manufactural wage earners employed in plants stressing the bailiwick and utilizing almost exclusively unmanufactured materials. Likewise the symbol, Y, refers to manufactured materials.

Table 47 presents the distribution, by bailiwick areas, of sources of materials (excluding fuel) purchased by Evansville factories using almost exclusively unmanufactured materials, and by Evansville factories using almost exclusively manufactured materials, as of 1933, largely. For further description of the table, turn to Appendix II.

ulated into an average, and then (2) assigned to the proper Group (of the five freight-rate Groups precedingly mentioned), and then (3) to the proper purchases bailiwick. The same steps were then followed for the freight sales of the factory. The result, in percentage form, is presented in Tables 48 (the Groups' freight in the bailiwicks) and 49 (the bailiwicks' freight in the Groups). These tables seemingly reveal little, if any, relationship between Manufactural Evansville's freight-rate heights and distance of shipment, as portrayed in the trade pattern.

This analysis and conclusion does not pertain to freight-rate advantages, or disadvantages, to Evansville, in competition with non-Evansville centers, and non-Evansville competitors. Of

TABLE 48

GROUPS' FREIGHT IN BAILLIWICKS^a

Freight Rate Groups ^b	Freight Rate Group's Percentage of the Freight (excluding Fuel)								
	From Bailiwick Area				To Bailiwick Area ^c				
	I	II	III	IV	I	II	III	IV	V
A. In terms of firms									
Group I. . .	0	16	0	0	35	11	12	8	50
Group II. . .	31	7	9	0	19	47	25	46	50
Group III. . .	3	21	15	38	36	25	38	38	0
Group IV. . .	47	55	76	63	10	17	25	8	0
Group V. . .	19	10	0	0	0	0	0	0	0
B. In terms of manufactural wage earners									
Group I. . .	0	9	0	0	21	5	6	2	37
Group II. . .	39	14	3	0	38	58	11	50	63
Group III. . .	1-	37	10	95	36	29	72	47	0
Group IV. . .	45	35	87	5	5	8	11	1-	0
Group V. . .	15	5	0	0	0	0	0	0	0

^aData based upon unpublished maps as in Table 40, and other information largely primary.

^bAs in Table 4, generalized:
 Group I, very high freight rates.
 Group II, high rates.
 Group III, Medium rates.
 Group IV, low rates.
 Group V, very low rates.

^cBailiwicks designated as in Table 40.

Table 48 presents the distribution of Manufactural Evansville's freight, by bailiwick areas and by freight rate Groups, as of 1933. It is assumed that the relative amount of freight, pertaining to a given bailiwick, is roughly proportional to the number of firms bailiwickling in it. The same assumption is made in terms of the number of manufactural wage earners of those firms. The assumption is supported by investigation and experience. For further description of the table, turn to Appendix II.

course Manufactural Evansville is affected by both her freight distances and her freight rates, in comparison with those of her competitors. But this is not the problem attacked herein. The problem is limited to: Manufactural trade distances versus her freight-rate heights.

TABLE 49
BAILLICKS' FREIGHT IN GROUPS^a

Freight Rate Groups ^b	Baillwick Area's Percentage of the Freight of Each Freight-Rate Group (except Fuel) ^c									
	Purchases from Baillwick Area					Sales to Baillwick Area				
	I	II	III	IV		I	II	III	IV	V
A. In terms of firms										
Group I. . .	0	100	0	0	68	18	7	2	5	
Group II. . .	48	22	30	0	25	51	10	10	4	
Group III. . .	3	48	39	10	48	28	16	8	0	
Group IV. . .	14	33	49	4	31	42	23	4	0	
Group V. . .	88	12	0	0	0	0	0	0	0	
B. In terms of manufactural wage earners										
Group I. . .	0	100	0	0	18	17	14	1	50	
Group II. . .	51	23	26	0	8	57	6	8	21	
Group III. . .	1-	17	29	54	9	33	49	9	0	
Group IV. . .	6	6	88	1-	8	49	42	1	0	
Group V. . .	70	30	0	0	0	0	0	0	0	

^aData based upon unpublished maps as in Table 40, and other information largely primary.

^bAs in Table 48.

^cBaillwicks are designated as in Table 40.

Table 49 presents the distribution of Manufactural Evansville's freight, by freight-rate Groups and by baillwicks, as of 1933. It is assumed that the relative amount of freight, pertaining to a given freight-rate Group, is roughly proportional to the number of firms assigned to the Group (on the basis of the freight rates they suffer). The same assumption is made in terms of the number of manufactural wage earners of those firms. The assumption is supported by investigation and experience. For further description of the table, turn to Appendix II.

Classes of Factory Trade-Patterns

Thus far, in this analysis of manufactural trade pattern as reflected by baillwick trade, the purchases pattern (minus fuel and electricity) and the sales pattern of a factory have been treated separately, whereas, in reality, each factory trade-pattern is comprised of the two components (purchases and sales), both of which are mutually essential phases of a functioning unity, an organism, and they should be analyzed conjunctively--a procedure

not unknown in geography. Attempts follow.

The purchase: sale pattern.--Herein the symbol, purchase: sale, is used to denote the fact that the purchase pattern and the sale pattern are being viewed conjunctively, i.e., concomitantly, because in reality they function mutually relatively. In a sense they constitute an "in" and "out" pattern; the purchases flow into the factory whilst the sales flow out. In general, the form, or shape, of the total, dual-pattern is important to the health of the business; it is a truism that, other things being equal, the shorter the total distance of flow (from source of materials, to factory, to customer), the more healthful is the set-up (because distance, and related time, are costly).

In the Purchase: sale pattern (for brevity, the symbol, p:s, is introduced--p for purchases; s for sales) distance of flow, (purchase-flow and sale-flow) was used as a basis of classification. Three distances of flow were employed: A, to represent the distance of Balliwick I; B, to represent the distance of Balliwick II; and X, to represent the large distance of the combined balliwicks, III, IV, and V. In classification, each factory was assigned to its proper flow-distances. For example, Ap:As represents a factory to which its purchases flowed from Balliwick I, and from which its sales flowed to Balliwick I. Likewise the symbol, Xp:As, designates a factory to which its purchases flowed long distance (combined balliwicks III, IV, and V), and from which its sales flowed to Balliwick I. The resulting classification of factory p:s patterns is presented in Table 50.

Table 48 presents nine classes of factory trade-patterns, together with the numerical importance of each. Outstanding numbers of Evansville factories (22 per cent) bought materials in the Neighborhood States and sold locally, i.e., in Evansville plus its Tri-State Area. Examples: planing-mills; printing-publishing. Also, outstanding numbers of the factories (22 per cent) balliwicked distantly in purchases and Neighborhoodly in sales; examples were: furniture (not all) and cigars (not all). Somewhat less common were the Bp:Bs patterns, also the Xp:Xs patterns, and the Ap:As patterns; --examples of the first were coffins and mattresses; of the second, refrigerators and stoves; and of the third, creameries and brick-yards (not all of them). Among still less-prevalent types, class Ap:Xs was illustrated by cake-flour and by vegetable canneries;

TABLE 50
FACTORY TRADE PATTERNS^a

Classes ^b	Per Cent ^c	Classes	Per Cent
Ap:As. . .	15	Bp:Xs. . .	3
Ap:Bs. . .	5	Xp:As. . .	5
Ap:Xs. . .	2	Xp:Bs. . .	22
Bp:As. . .	22	Xp:Xs. . .	13
Bp:Bs. . .	13		

^aBased upon maps as in Table 40.

^bHerein the symbol:

A, means Bailiwick I.

B, means Bailiwick II.

X, means Bailiwicks III-V.

p, means purchases-distance.

s, means sales-distance.

^cPercentage of all factories.

Table 50 presents the percentage distribution of classes of factory trade-patterns in terms of bailiwick-distance of purchases and sales, as of the early 1930's. For further description of the table, turn to Appendix II.

class Bp:Xs by brooms (not all) and by patent medicines (not all); class Ap:Bs by railroad ties; and class Xp:As by granite monuments.

Upwards of four-fifths of the factories emphasized sales in bailiwick areas I and II (although they included only two-thirds of the classes), an expectable portion because the larger (fewer) firms in general sold far afield. But the bailiwick purchases of the three-fourths extended into areas beyond the Neighborhood States. This p:s distribution emphasized a normal trait of manufactural Evansville's basic trade-pattern, i.e., short-haul sales, in territory where her distant competitors had the disadvantage of long-haul sales--in other words, sales in territory where the effective competition came largely from neighbor and quasi-neighbor competitors. On the other hand, the bailiwick purchases of the three-fourths extended into more distant fields largely through necessity--a matter of rather limited, and rather inflexible, sources of materials. (As stated in Chapter III, Manufactural Evansville had evolved. In the eighteen-thirties her raw materials were chiefly near at hand; but in the nineteen-thirties many of the major sources had receded.)

The chief conclusion growing out of findings in the analysis of the factory purchase:sale patterns are: Manufactural Evansville enjoyed considerable choice in selection of sales territory; but she was under considerable necessity in selecting purchase territory.

Favorable vs. unfavorable patterns.--Although p:s patterns exhibit an advantage in simplicity and relative ease in classification, they are largely descriptive, and therefore somewhat inert. Less inert, but highly burry, are favorable versus unfavorable manufactural trade-patterns.

By favorable pattern herein is meant a pattern which is, in the writer's studious impression or considered opinion, favorable for carrying-on with profit, other things not considered. The Evansville factory trade-patterns were analyzed and classified into three types: patterns clearly favorable; those clearly unfavorable; and those largely neutral, i.e., neither clearly "healthful" nor clearly "unhealthful." In the classification of each factory's trade-pattern and chief basis was the answer to the following questions: "Does the flow of the freight from the sources of the supplies (fuels and electricity included) to the destinations of the products appear to involve a near-minimum of ton-mileage? Essentially a near minimum of conveyance-costs? Would a different location of the factory bring about a nearer-minimum of ton-mileage in the same trade-pattern?"

In the analysis a number of items were ignored, as for example: (1) Other potential sources of supply or destinations of products; (2) amount of freight; (3) freight rates; (4) labor; and (5) non-Evansville competitors. More-or-less held in mind, more-or-less systematically, in the analysis, were a number of background items, such as (1) the conveyance patterns; (2) freight classes of the supplies versus freight classes of the products; and (3) amount of fuel and purchased electricity used by the factory.

An example of a trade pattern held thus clearly favorable is that of a certain factory producing flour from soft wheat. The wheat, under milling-in-transit terms, flowed almost in a straight line southeastward to Evansville (local coal), and thence, as flour, continued southeastward to Southern markets centering in southern Alabama and Georgia and northern Florida. An example

of a trade pattern held thus clearly unfavorable is that of a certain factory producing cigars. The leaf tobacco flowed from the West Indies (via New York) Connecticut, southeastern Pennsylvania, and southeastern Ohio, mainly west-southwest to Evansville (local coal but modest in quantity needed); but from there the cigars flowed northeast, north, and mainly northwest to a market centering probably a bit northwest of Chicago. (In this case, factors other than cost of conveyance anchored the factory at Evansville, for example, advantageous labor, manufactural momentum, personal considerations.) An example of a trade pattern held thus largely neutral is that of a certain toilet-seat factory. The supplies came from widely scattered points in Manufactural Evansville's main trade province, and the products were sent to widely scattered areas in the South and Southwest.

The classification under consideration is quasi-objective-subjective opinion, and therefore vulnerable; but it is assertedly justifiable for purposes of penetrations and conclusions.

This favorable-versus-unfavorable classification of the trade patterns of the factories, this classification on the basis of the quality of the pattern, as of the early nineteen-thirties, revealed, happily, a generally sound condition of the pattern layouts (Table 51). It disclosed that a healthy percentage, 87, of the trade patterns of the factories were opined to be favorable, and only a few per cent unfavorable. In addition to Component-soundness, this classification revealed some relationship between quality of manufactural trade patterns and distance to trade areas, especially bailiwicks. The shorter distances were associated with a higher percentage of favorable trade patterns, and vice-versa, with exceptions. For example, the quality of the trade patterns of all of the factories buying from, and selling to, Bailiwick I, was held to be high, whereas only about 85 per cent of the patterns of factories bailiwickling in the Neighborhood States were classified as favorable, and the percentage with respect to the even more distant bailiwicks was only 62. Thus it appears that factories trading afar encounter considerable difficulty in creating and maintaining favorable trade patterns (especially during periods of economic depression). It should, however, be kept in mind that the success of a manufacturing firm is not dependent solely upon the quality of its trade pattern.

TABLE 51
QUALITY OF PATTERNS^a

Classes of Factories	Percentage Distribution of Factories with Trade Patterns Which Are:		
	Favorable	Unfavorable	Neutral
All factories.	87	6	7
Factories buying chiefly from Evansville Tri-State Area	100	0	0
Factories selling chiefly to Evansville Tri-State Area. .	100	0	0
Factories chiefly selling to and buying from Evansville Tri-State Area	100	0	0
Factories buying chiefly from the Neighborhood States. . .	91	6	3
Factories selling chiefly to the Neighborhood States. . .	86	5	9
Factories chiefly buying from and selling to the Neighborhood States.	85	5	10
Factories buying chiefly from afar (beyond the Neighborhood States).	79	12	9
Factories selling chiefly afar	62	25	13
Factories chiefly buying from afar and selling afar. . . .	62	24	14

^aThe statistics are based chiefly upon an analysis of unpublished maps of the manufactural trade patterns of each of the factories, and upon judgment.

Table 51 presents a classification of Evansville factories on the basis of distance to trade areas and alleged favorableness of the manufactural trade pattern, as of the early 1930's. For further description of the table, turn to Appendix II.

The generally high quality of the trade-patterns of Manufactural Evansville, as heretofore revealed, is a strong point in favor of her success in the future.

Quality patterns by groups.---Attention is now invited to a brief examination of the opined quality of the trade patterns in terms of the nine manufactural Groups, as of the early nineteen-thirties, with a view toward a bit of explanatory summation. There was spread in the percentage of favorable patterns by Groups (Table 52): All of the (first-place) paper-printing-publishing Group had favorable patterns, but only about one-fifth of the (last-place)

TABLE 52
PATTERNS OF THE GROUPS^a

Manufactural Groups	Quality of Trade Patterns: Percentage of Group's Factory Patterns Which Are:		
	Favorable	Unfavorable	Neutral
Paper-printing-publishing. .	100	0	0
Food	94	0	6
Wood	93	3	4
Stone, coal, sand, clay. . .	93	7	0
Miscellaneous.	86	0	14
Metals and alloys.	75	12	13
Chemicals.	50	0	50
Clothing, textiles, leather.	39	15	46
Tobacco.	20	80	20

^aThe statistics are based chiefly upon unpublished maps, primary information, and judgment.

Table 52 presents a classification of manufactural trade patterns, by alleged quality and by manufactural Groups, as of the early 1930's. Example: about 94 per cent of the factories of the food Group had allegedly favorable patterns.

tobacco Group had such. In this analysis of the quality of the patterns by Groups, the correlation between high quality of pattern and short distance is striking, as it was in the analysis of all of the patterns by bailiwicks.

Three Groups (printing, stone, and food) had high quality of patterns because of largely local materials, or markets, or both. The printing Group automatically achieved favorable patterning because the markets were essentially all local. The markets of the stone Group were local, with few exceptions (such as face-brick, procelain-tableware), and ditto the sources of supplies, with some exceptions (granite, marble, materials for pattern, and coal for gas). The patterns of the food Group were also local, with a few large exceptions, such as distant sources of sugar, distant markets for canned vegetables, flour, and some of the packed-meats and packed-produce, as well as the widely-spread destinations of cake flour, and food especially processed for infants. During a century of births and deaths in Manufactural Evansville, demises among the food Group were outstandingly few; this was due, in part only, to quality of trade pattern, for other factors entered--such as persistent local-food-consumptivity.

The lowest-ranking two Groups (tobacco, and textiles et alii) had the disadvantages of mainly distant-materials, markets, or both. In the evolution of Manufactural Evansville, fluctuations in the clothing-textile categories have been strikingly outstanding. Based largely upon auxiliary labor (with some exception), and facing large distances in trade, they have, with small exception, flourished opportunely and languished interally. The tobacco Group evolved from the manufacture of pipe, snuff, and chewing tobaccos, to the manufacture of cigars (chiefly). This category in the early nineteen-thirties was based solidly upon manufactural momentum and a pool of apt labor (partly auxiliary); but it was handicapped by long distance to suitable leaf-tobaccos, and an unfavorable trade pattern. The outlook had grown more complicated by the rise of machine-made cigars and the rise, at Evansville, of production of some of the cigars for chain stores, and similar commercial establishments.

The wood Group evolved solidly largely upon local wood and coal, and its categories in the early nineteen-thirties, with exceptions, enjoyed the advantages of considerable local materials, Evansville's strategic position with respect to distant hardwoods, or both. There was also considerable production for mail-order firms, and (in the late nineteen-twenties) satellitic or "decentralized" production for automobile firms, chiefly in Detroit. Thus anchored, the manufactural trade-patterns of the wood Group could be maintained mainly favorable.

The Group, metals-alloys, throughout most of the history of Manufactural Evansville performed notably by maintaining averagely superior (though not peak) quality of trade patterns despite a major handicap of long distances both from supplies (except coal and electricity) and to markets (except relatively small local-consumptivity). During the decades when the market was largely Southern, the freight mostly moved forward; from the North, through the Evansville factories, to the South, encouraged especially by the strategic position of Evansville, her Ohio River gateway-advantages, and by the unique economic structure of the South. However, that easement of the problem of favorable trade-pattern has declined somewhat with the shifting of Manufactural Evansville's markets for her manufactured steels progressively into the territory of the American Manufacturing Belt. The crux

is Evansville's position on the southwestern margin of that Belt. The materials largely must move generally southwestward and southward to the Evansville factories, and thence (as products) radially outward, mainly northeastward. Nevertheless the Group has risen to a notable position; this implies the potency of other factors, such as management, labor, fuel, and some satellitic production for special outlets.

Section 4. Pattern of the Competition

Competitors.--The manufactural centers which competed with Manufactural Evansville spread roughly over the territory of her main trade province (previously described), and beyond eastward, especially through Pennsylvania to the city of New York (Fig. 33). Such competitive centers were largely absent in the Deep South; but, nevertheless, there Evansville and her rivals competed (from afar). Similar competition occurred in the tiers of states both west of, and near, the Mississippi River.

The Neighborhood States housed the most dense distribution of her competing centers. Progressively beyond those states the distribution was less dense, with minor exception. Distance appeared to be important. Within the Neighborhood States there was competition encountered from centers beyond; but it was weak compared to the keen competition met from centers within, for there Evansville and her antagonists contested on more or less equal terms, distance considered. Conversely, in sales afar Manufactural Evansville suffered increasingly effective competition--from centers located in those far areas, or at least less distant than Evansville, or from centers with some other competitive advantages. For example, in the sale of furniture casters in the city of New York, Evansville encountered severe competition from Connecticut. With some exception, in some of the more distant industrial areas the advantages of propinquity were so great that Evansville did not sell therein, did not compete. Therefore few sellers in such distant areas appear as competitors of Evansville, on the map--which goes far to explain the smaller density of competitor centers greatly distant from Evansville. The most striking exception is the New York Industrial District in which, because of the large and rich market, Manufactural Evansville waged keen competition in a number of products.

Competition.--In variety of competition, especially in terms of specific products sold in competition with Manufactural Evansville by her competing centers, the role of distance loomed stronger (Fig. 33). Manufactural Evansville was encircled by nodes of multiform competition: St. Louis, Chicago, Indianapolis, Cincinnati, Louisville, Nashville, and Memphis. Her forest of competition was most dense and most variegated in the Neighborhood States, and roughly less thus, increasingly beyond. Although protected somewhat by the relatively large size of the Evansville Tri-State Area, she had to endure, from without, competition within her very city, by no means mild.

Adverse spots.--In addition to the general multiform conflict, there were spots of emanation of special adverse strength. Examples: (1) The battery of centers in the Southern Appalachians (exemplified by High Point, North Carolina), specializing in low-price class furniture--also south-central Indiana; (2) the zones of higher-price class furniture, in Michigan, northwestern Illinois, Wisconsin, Jamestown (New York); (3) newly risen centers of stove production in the South--also irons, cottons, woods; (4) pottery and vitrified sanitary wares, in Wisconsin, Illinois, and Ohio; (5) cigars, in Ohio, Pennsylvania, New York, and Florida; (6) bottle caps, in Wheeling and New York; (7) hand tools, in West Virginia and Connecticut; and (8) canning, in Delaware, New Jersey, and New York.

Favorable spots.--On the other hand there were localities which were especially attractive to specific manufacturing industries of Evansville. Examples: (1) The Mid Continental and Pacific petroleum fields, for mining machinery and operative machinery, also brass fixtures; (2) likewise the local coal field; (3) the deep Southeast, for soft-wheat flour; (4) the middle Atlantic seaboard, for steel scaffolding; (5) the malarial South, for patent medicines; (6) the Ozarks and southward, for clothing, and tableware; (7) the Evansville-New York "ribbon," for packed-meat and packed-produce (in accord with the packers' policy of "ship eastward"); (8) large cities with natural gas, for (gas-fired) refrigerators; (9) Detroit industrial district, for automobile parts; and (10) Chicago mail-order and department-store establishments, for "decentralized" products.

Section 5. Trade Pattern Evolution

That there has been evolution in the manufactural trade pattern of Evansville has been stated, and described, in Chapter III. Both the materials-pattern and the products-pattern have expanded. Significantly there has been recession in some of the materials; the distance to materials has become a matter of concern. The pattern in the early nineteen-thirties was mature. It was being maintained through rejuvenation and changes.

Induced materials.--When local materials have become inadequate (through depletion, manufactural expansion, or whatnot) and serious recession has taken place among the essential extra-local supplies, then producers of local materials are likely to be encouraged to increase their production of old lines and to add desirable new lines. Manufacturers, or others, may encourage to a degree amounting, in effect, to inducement; or alert producers may be self-induced by sighted opportunities; or prospective manufacturers of new lines of output may react inductively to local material potentialities. The advent of a variety of induced local materials is a herald, a minor-herald, of significant changes, in events, attitude, and pattern-stage. It is a minor herald of incipient late-maturity. Incipient induction of local materials was operative in the Evansville Tri-State Area in the early nineteen-thirties. In it was potential mutual-advantage for the manufacturer and the producer.

There was incipient inducement of local agricultural materials, especially cereals, livestock, and animal produce, also farm and garden produce. It was being brought about in part through (1) the agricultural agent, (2) manufactural guidance, and (3) commercial and civic guidance. There was contract-growing of tomatoes for the cannery; increased spread of grain elevators, stations for reception of grain for local milling; experimentation in producing seeds for local commercial-processing, also experimentation in the production of edible soya beans for flour, and others for oil and sauce; and ventures in the production of apples for vinegar. Also, there was trial-production of quick-growing woods for boxes, and encouragement of drilling for oil and gas. Improvement of the highways and their patterns was being

followed by increased receipts by Manufactural Evansville, especially local livestock, produce and grains.

Local induced-materials would provide a bit of easement of the surmountable problem, distance to materials.

APPENDIXES

APPENDIX I
ADDITIONAL TABLES
TABLE 53

MANUFACTURAL GROUPS: GROWTH^a

Manufactural Group	Number of Wage Earners in Hundreds								
	1859	1869	1879	1889	1899	1914	1919	1929	1932
Wood.	2.6	8.6	11.5	19.1	20.5	26.3	33.5	50.0	16.1
Metals and alloys. . . .	2.8	4.9	7.3	11.1	12.4	21.1	32.1	45.2	36.4
Tobacco	0.5	1.1	1.2	1.8	5.5	18.7	26.7	25.0	15.1
Food materials.	0.5	0.8	2.2	4.0	3.9	4.7	9.3	11.2	11.1
Textiles, clothing, leather.	0.1	5.4	4.5	7.4	10.1	5.5	4.4	5.8	10.6
Coal, stone, sand, clay. .	1.1	2.2	1.4	3.2	5.7	5.9	5.2	5.8	3.0
Paper and printing. . .	0.5	0.7	0.7	0.9	2.4	2.7	2.8	2.3	1.8
Chemicals	0.1	0.1	0.1	0.1	0.6	0.6	0.8	0.5	0.4
Other materials	1.1	4.5	2.9	15.1	11.9	23.2	11.7	3.9	2.8
Totals	9.2	28.2	36.7	74.4	72.8	103.3	125.3	149.2	97.2

^aThe estimates are based upon reports of the Census, together with statistical and historical data gathered from Evansville city directories, local histories and newspapers, also questionnaires, personal interviews, and field work.

Table 53 presents the evolution of the nine manufactural Groups in terms of estimated number of wage earners. Because of primary information, the statistics for 1929 and 1932 for the Group Other Materials, contain no wage earners belonging to the other Groups. Such is not completely the case for previous years, although the Group in each case has largely been reduced by means of complicated information. The Group, Other Materials, contains a number of wage earners not assignable to the other Groups, e.g., the categories: brooms, liquors, soft drinks, and ice, etc.

TABLE 54
GROUPS RANKED BY WORKER VOLUME^a

Manufactural Groups	Ranking of Manufacturing Group on Basis of Wage Earners ^b								
	1860	1869	1879	1889	1899	1914	1919	1929	1932
Wood.	2	1	1	1	1	1	1	1	2
Metals and alloys	1	3	2	3	2	2	2	2	1
Tobacco	5	6	7	7	6	3	3	3	3
Food materials. .	5	7	5	5	7	7	4	4	4
Textiles, cloth- ing, leather. .	8	2	3	4	4	6	7	5	5
Coal, stone, sand, clay.	3	5	6	6	5	5	6	6	6
Paper and printing	5	8	8	8	8	8	8	8	8
Chemicals	9	9	9	9	9	9	9	9	9
Other materials .	4	4	4	2	3	4	4	7	7

^aThe ranking is based upon the number of wage earners, as in Table 53.

^bThe symbol, 1, means first; the symbol, 9, means last.

TABLE 55
GROUPS RANKED BY DOLLAR VOLUME^a

Manufactural Groups ^b	1859	1869	1879	1889	1899	1909	1914	1919	1929	1932
Wood.	3	2	1	1	1	1	1	1 ^c	2	2 ^c
Food.	1	4	2	2	2	3	2	1 ^c	1	1
Metals and alloys. . .	2	3	3	4	3	2	3	1	3	2 ^c
Tobacco . . .	6	7	7	7	4	4	4	4	4	4
Leather, clothing, textiles. .	8	1	4	3	5	5	7	6	6	6
Coal, stone, and clays .	5	5	6	6	7	6	6	5	5	5
Paper and printing. .	7	8	8	8	8	8	8	7	7	7
Chemicals . .	9	9	9	9	9	9	9	9	9	9
Others. . . .	4	6	5	5	6	7	5	8	8	8

^aStatistics are based chiefly upon Census reports, except for 1932, which are based upon personal interviews and questionnaires.

^bThe ranking is on the basis of gross value of products.

^cIn 1919 and 1932, some of the Groups were approximately equal in rank.

TABLE 56
GROUPS RANKED ABSTRACTLY^a

Manufactural Groups	Rank of Manufactural Groups on Bases of Number of Wage Earners, Gross Production ^b								
	1859	1869	1879	1889	1899	1914	1919	1929	1932
Wood.	2	1	1	1	1	1	1	1	2
Metals and alloys .	1	2	2	2	2	2	2	2	1
Food.	3	6	3	3	3	4	3	3	3
Tobacco	7	7	7	7	6	3	4	4	4
Textiles, clothing, leather	8	2	4	4	4	7	7	5	5
Coal, stone, sand, clay.	4	5	6	6	7	6	5	6	6
Paper, printing, publishing. . . .	6	8	8	8	8	8	8	7	8
Chemicals	9	9	9	9	9	9	9	9	9
Others ^c	5	4	5	5	5	5	6	8	7

^aThe data were calculated from Tables 54 and 55, as of equal weight.

^bEach vertical column depicts the ranking of the Groups for a specific date. Each horizontal column reveals fluctuations in the ranking of a specific Group.

^cThe Group, "Others," was subject to special variations: the Eighteenth Amendment, affecting one of its categories, beer; problems in breaking down Census statistics, which were solved for 1929 and 1932, with the aid of primary information.

Table 56 presents the evolution in the rank of the nine manufactural Groups of Evansville. Emphasized are: long predominance of the wood Group; tenacious major importance and recent supremacy of metals-alloys; persistent major importance of food; gradual rise of tobacco to major Group importance, although but a single commodity; fluctuation of the minor Group, leather-clothing-textiles; fluctuation, likewise (but with smaller amplitude) of the minor Group, stone-clay-sand-coal; perennial, but modest, importance of the Groups, paper-printing, and chemicals; finally, the fluctuations of the Group, others.

TABLE 57

MINUTIA OF SUPPLY^a

Territory	Fuels and Materials. Outstanding Purchases in the Territory by Manufactural Evansville
Central Freight Association	Aluminum; ammonia; automobile engines and parts; benzol and acetone; bottle caps; brass and parts; boxes and crates; brewers cornflakes; broom corn; butter; cartons; clay: fire, brick, shale; cloth: suit, cotton; coal; coke; containers, wood; copper: bulk, processed material and parts; corn; cream; eggs; enamel; excelsior and pads; felt; flint; fruit; glass: bottles and jars, cullet, plate; hair; hardware; hoops, steel; iron: cast, pig, malleable, processed materials and parts, wrought; kegs; leather; live stock; lumber: hardwood, softwood, plywood, veneer; logs: hardwood, softwood; metal fixtures; milk; naptha; natural gas; newspaper; nickel; oils and lacquers; paints and varnishes; paper: job printing, waste; packing cases; porcelain; pottery pins and stilts; poultry; rope: common, Manila, twine; rubber; processed materials and parts; sand: common, molding, for glass; soya beans; spices; steel: heavy processed materials, light processed materials and parts; stone: limestone and sandstone; tin plates; tobacco; vegetables; vinegar; wheat; wire; wool.
Southern Freight Association	Aluminum; bags; boxes, cartons; clay: pottery, kaolin; coal: high grade (eastern), medium grade (western); coffee; coke; cloth: suit, cotton; cotton; cream; eggs; feldspar; hoops, steel; iron: cast, pig, malleable; jute; kegs; live stock; logs: hardwood, softwood; lumber: hardwood, plywood, softwood, veneer; milk; monumental stone; moss fiber; oils and lacquers; poultry; railroad ties; rayon; rope and twine; steel, heavy processed materials; sugar; turpentine; tobacco; vegetables; wool; yarn: cotton, mop, rayon.
Trunk Line Association	Carborundum; chemicals; drugs; emery; hardware; kapok; paper; plate glass; seat coverings; silk; spices; suit cloth; tapioca flour; tin plate; tobacco; vegetables; wool; yarn: cotton, mop, rayon.
Western Trunk Line Committee	Benzol and acetone; cartons; cobalt; flour; hardware; job printing paper; leather; light processed steel materials; malleable iron; malt; wheat; wood containers.
Southwestern Freight Bureau	Bags; cotton; logs: hardwood, softwood; kaolin; lumber; hardwood, softwood.
New England Freight Association	Aluminum; brass parts; cod products; cotton cloth; kaolin; metal fixtures; monumental stone; paper bags; processed bronze materials; tobacco.
Pacific Coast	Hops; softwood lumber.

Footnotes

^aData based upon multitudinous sources.

Table 57 lists the outstanding purchases of fuels and materials by Manufactural Evansville, in railroad Freight Traffic Association territories, as of the early 1930's. The fuel supply has always been largely local. In materials the territory of the Central Freight Association led in quantity and variety, followed by the territory of the Southern, not very closely, and by the Trunk Line, a good third. The Rocky Mountain area and its eastern foreland shipped very little to the Manufactural Component, the Pacific Coast a bit more. The data are portrayed in map-diagram form, in Figure 13, to indicate the purchases pattern of Manufactural Evansville.

In 1929 about 1 per cent of the manufactural wage earners worked in such factories of Evansville as obtained as much as 60 per cent of their materials in that city. Approximately 6 per cent were of factories which purchased chiefly in the Tri-State Area beyond Evansville. About 93 per cent of the earners were of firms which secured 60 per cent, or more, of their materials from beyond the Evansville Tri-State Area. A small amount of the materials (perhaps as much as 2 per cent) was received from the West Coast, Canada, and overseas.

TABLE 58
MINUTIA OF PRODUCTS^a

Territory	Outstanding Sales of Products in the Territory, by Manufactural Evansville
Central Freight Association	Agricultural implements and machinery; architectural, constructional and ornamental metal and wood products; automobile bodies, parts, trucks; bakery products; beer; bottle caps; boxes and crates; bricks; brooms and mops; cake flour; candy; canned and packed produce; casters and other furniture fixtures; cigars; clothing; coffins; confectioneries; cooperage products; cottons; cut stone; monuments; electricity; electrical implements and equipment; elevators; enameled products; excavating implements and machinery; fine hosiery; flour; foundry and machine shop products; furniture; gas engines; glass bottles, etc.; hand tools; horse collars; leather products; lumber; malleable castings; mattresses; metal platings; mirrors; metal stampings; mining equipment; newspapers, printing, books; packed meats; paints and varnishes; paper; pharmaceuticals; pharmaceutical foods; planing mill products; pottery; processed coffee; radio cabinets; railroad ties; refrigerators; soya flour; steel scaffolding; stoves; tents and awnings; toilet seats, rubber and processed wood; vinegar; vitreous fixtures for bath rooms; wagon parts; wood bathroom tanks and seats.
Southern Freight Association	Agricultural implements and machinery; architectural constructional and ornamental metal and wood products; beer; bottle caps; bricks; brooms, mops; cake flour; candy; casters and other furniture fixtures; clothing; coffins; cotton harness parts; cut stone, monuments; flour; foundry and machine shop products; furniture; glass bottles, etc.; hand tools; horse collars; leather products; mattresses; newspapers, printing, books; paints and varnishes; patent medicines; pottery; processed coffee; refrigerators; stoves; toilet seats, rubber and processed wood; wood bathroom tanks and seats.
Trunk Line Association	Agricultural implements and machinery; architectural, constructional and ornamental metal and wood products; boxes and crates; brooms, mops; cake flour; candy; casters and other furniture fixtures; cottons; electrical implements and equipment; excavating machinery; fine hosiery; foundry and machine shop products; furniture; gas engines; handtools; lumber; packed meats; packed and canned produce; paper; pharmaceutical foods; refrigerators; steel scaffolding; soya flour; stoves; tents and awnings; toilet seats, rubber and processed wood; vitreous fixtures for bath rooms.
Southwestern Freight Bureau	Agricultural implements and machinery; beer; bricks; brooms, mops; cake flour; clothing; cotton parts for

TABLE 58--Continued

Territory	Outstanding Sales of Products in the Territory, by Manufactural Evansville
	harness; furniture; gas engines; hand tools; horse collars; mining equipment; paper; patent medicines; pottery; refrigerators; toilet seats, rubber and processed wood; vitreous fixtures for bathrooms.
New England Freight Association	Brooms, mops; canned and packed produce; cottons; hand tools; lumber; packed meat; pharmaceuticals; pharmaceutical foods.
Western Trunk Committee	Agricultural implements and machinery; cake flour; casters and other furniture fixtures; cigars; furniture; gas engines; hand tools; soya flour.
Pacific Coast (part of Trans-conti- nental Freight Bureau)	Furniture; hand tools; pharmaceuticals; pharmaceu- tical foods; refrigerators; soya flour; toilet seats, of rubber and processed wood.

^aData based upon multitudinous sources.

Table 58 lists outstanding sales of Evansville manufactured products, by railroad Freight Traffic Association territories, as of the early 1930's. The territory of the Central Freight Association led in variety and quantity, followed by the territories of the Southern Freight Association and the Trunk Line Association. Formerly the Southern territory led in quantity. The Rocky Mountain area and its eastern foreland purchased very little. The data are portrayed in map-diagram form in Figure 11, to indicate the sales pattern of Manufactural Evansville.

In 1929 about 8 per cent of the manufactural wage earners worked in such factories of Evansville as sold as much as 60 per cent of their products in that city. Approximately 2 per cent were of factories which sold chiefly in the Tri-State Area beyond Evansville. About 90 per cent of the earners were of firms which sent 60 per cent, or more, of their manufactures beyond the Evansville Tri-State Area. A small amount, perhaps as much as 3 per cent, was exported.

TABLE 59

FACTORY ESTABLISHMENTS 1935^a

Classes and Kinds ^b		Classes and Kinds	
Number		Number	
1.	Food and kindred products.	58	Planing-mill products not of saw-mills
	Beverages, non-alcoholic.	4	Wood turned and shaped and other wooden
	Bread and other bakery products.	19	goods n.e.c.
	Butter.	4	4. Paper and allied products.
	Canned vegetables and fruits.	2	5. Printing, publishing, and allied prod-
	Condensed and evaporated milk.	1	ucts.
	Corn sirup, corn sugar, corn oil, and	3	Engraving.
	starch.	2	Book and job.
	Food prepared for animals and fowls.	6	Periodicals and newspapers.
	Flour and other grain-mill products.	2	6. Chemicals and allied products.
	Food preparations n.e.c.	4	Drugs and medicine.
	Ice cream.	3	Insecticides and allied products.
	Ice.	2	Paints, pigments, and varnish.
	Liquors, malt.	4	Perfumes, cosmetics, other toilet prep-
	Meat-packing, wholesale.	1	arations.
	Poultry dressing.	1	7. Products of petroleum and coal.
	Vinegar and cider.	5	Gas.
2.	Textiles and their products.	1	Electricity.
	Cotton.	2	8. Rubber products.
	Fabricated textile products and other	1	Other than tires, boots and shoes.
	than wearing apparel.	1	9. Leather and its manufactures.
	Knit goods.	1	Saddlery, harness, and whips.
	Men's clothing n.e.c.	34	10. Stone, clay, and glass products.
3.	Forest products.	1	Clay products (not pottery) and non-
	Basket ware.	2	clay refractories.
	Boxes, wooden and part wooden.	1	Concrete products.
	Caskets.	2	Marble, granite, slate, and other
	Cooperage.	15	stone, cut and shaped.
	Furniture, including store and office	3	Mirrors.
	fixtures.		Pottery, including porcelains.
	Lumber and timber n.e.c.		

TABLE 60
DETAIL BREAKDOWN 1867^a

Category	Number Persons Employed	Gross Production (\$1,000)
Agricultural implements.	...	\$ 75
Architectural castings	...	40
Ale, porter, beer.	...	245
Bricks (22,250,000).	...	150
Bellows.	...	3
Blacksmithing.	48	109
Candy.	...	36
Candles and soap	...	75
Clothing	85	101
Cooperage.	...	68
Copper, brass, sheet-iron and tin work	...	189
Cotton mill.	42	...
Drugs.	...	30
Furniture.	231	170
Hats and caps.	...	150
Iron, wrought work	...	83
Lumber, product of saw mills	...	210
Leather.	21	71
Marble and dressed stone	...	81
Machinery.	...	231
Mills, flouring and meal	...	304
Potteries.	...	21
Planing, sash, doors, etc.	...	99
Printing and binding	...	140
Paper.	...	3
Rolling mill	14	60
Stoves and hollow ware	...	118
Saddlery and harness	70	131
Shingles	...	46
Safes, iron.	...	3
Shipyard	...	30
Trunks	...	3
Upholstering	...	51
Vinegar and wine	...	10
Woolen mills	54	82
Wagons and carriages	80	124
Total		\$3,200+

^aData are largely from John W. Foster, Annual Report of the Board of Trade of Evansville, Indiana, for 1867 (Evansville, 1868), p. 101.

Table 60 presents the manufacturing categories and performance in Evansville, for the year ending November 1, 1867. Iron and other metals led (\$907,000; employment, 349); wood was second (\$747,000). Other Groups ranked as follows: leather-textile-clothing (\$442,000; food, \$350,000; stone, \$252,000; printing-paper-publishing, \$143,000; chemicals, \$105,000; others, \$245,000.

TABLE 61

MANUFACTURAL-COMMERCIAL 1874^a

Commodity ^b	\$1,000	Commodity	\$1,000
*Agricultural implements and seeds.	500	*Iron safes and bedsteads.	11
*Ale bottled.	71	Jewelry, watches, silverware, etc.	200
Architectural castings.	40	*Leather, hides, oil.	500
Auction and commission.	608	*Lightning rods.	5
*Beer and malt liquors.	690	*Liquors and wine.	3,500
Books and stationery.	135	*Marble and building stone.	135
Boots and shoes.	1,500	Millinery.	40
Bottled sauces, table notions, etc.	8	*Music and musical instruments.	100
*Brass manufactures.	125	*Paper, blank books, bindings, etc.	260
*Bricks.	200	*Paper, wrapping.	5
*Brooms.	15	*Plows.	145
Building improvements.	3,000	Produce--wool, feathers.	300
*Carpets, oil cloth, etc.	200	Realty sales.	2,308
*Carriages.	130	*Saddlery and saddlery hardware.	500
China and Queensware.	500	Salt, lime, cement, plaster.	200
Clothing.	1,250	Sewing machines.	170
Coach trimmings and horse goods.	100	*Ship chandlery, boat stores.	150
Coal, its local trade.	174	*Soap and candles.	60
*Confectionery.	400	*Steam, gas and water fixtures.	45
*Cooperage, staves, shingles, etc.	150	*Stoves and hollow-ware.	640
*Cotton fabrics manufactured.	150	*Sugar cane machinery.	30
Dry goods and notions.	5,100	*Terra cotta and stone-ware.	30
Drugs and chemicals.	1,100	*Tin, copper and sheet-iron ware.	500
*Engines, boilers and machinery.	1,091	*Tobacco and cigars.	3,545
*Enameled grates and mantles.	10	Toys, fancy goods and fire works.	50
*Edge tools and cutlery.	40	*Trunks.	30
*Furniture and chairs.	825	*Wagons, wheels, hubs, Wall paper, window shades etc.	100
*Grain and flour.	5,075	*Wood, lumber, etc.	3,000
Groceries.	6,000	*Woolen fabrics, manufactured.	125
Galvanized cornices.	60	Miscellaneous retail trade estimate.	2,000
Hair goods.	15	*Miscellaneous manufactures.	2,225
Hardware, jobbing.	600	Grand total.	52,477
Hats, caps, furs, and straw goods.	600		
Hogs and provisions.	500		
*Hosiery.	13		
*Ice.	140		
Iron, merchant and heavy hardware.	350		
Iron pumps.	4		
*Iron railings and jail work.	15		

Footnotes

^aBased upon Charles E. Robert, Evansville, Her Commerce and Manufactures (Evansville, 1874).

^bAn asterisk designates a commodity which was manufactured in Evansville in the early 1870's.

Table 61 presents an estimate of Evansville manufacturing and trade as of 1874, herein generalized. Robert was a contemporary, and he based his estimates upon information furnished him by merchants and manufacturers as to their own business, upon a mean of estimates by those having knowledge concerning the business of individual firms, and upon returns made to the Internal Revenue Department. Perhaps it is a bit optimistic; certainly it is useful. This estimate is a summary of a 450 page analysis of Evansville manufacturing and trade, made by Robert.

TABLE 62
ASSESSED VALUATION^a

Date	Real Estate (\$1,000)	Personals (\$1,000)	Total	
			(\$1,000)	X ^b
1824. . . .	28	8	36	1
1839. . . .	655	185	840	23
1840. . . .	599	245	845	23
1841. . . .	566	165	727	20
1842. . . .	...	...	543	15
1843. . . .	...	...	953	27
1844. . . .	...	...	550	15
1845. . . .	388	100	487	13
1846. . . .	547	271	818	23
1847. . . .	531	371	901	25
1848. . . .	664	398	1,061	29
1849. . . .	951	396	1,347	38
1850. . . .	1,216	577	1,693	47
1851. . . .	1,387	521	1,907	53
1852. . . .	1,458	598	2,056	57
1853. . . .	1,912	726	2,538	72
1854. . . .	2,095	516	2,611	73
1855. . . .	2,169	840	3,009	84
1856. . . .	2,240	946	3,186	88
1857. . . .	3,330	1,069	4,399	122
1858. . . .	3,122	1,248	4,370	121
1859. . . .	3,653	1,354	5,007	139
1860. . . .	3,962	1,958	5,920	166
1861. . . .	3,913	1,473	5,386	150
1862. . . .	4,199	1,501	5,700	158
1863. . . .	4,688	2,869	7,557	210
1864. . . .	5,591	3,679	9,225	256
1865. . . .	6,591	4,577	11,167	310
1866. . . .	9,742	5,563	15,305	425
1867. . . .	11,130	4,656	15,786	439
1880. . . .	.....	.....	20,000	555

^aData based upon typed copy of John W. Foster, Annual Report of the Board of Trade of Evansville, Indiana, for 1867 (Evansville, 1868), p. 13.

^bThe symbol, X, means: multiples of assessed valuation, as of 1824.

Table 62 gives the assessed value of Evansville submitted as an (imperfect) indicator of the city's growth. Evansville was first platted in 1814; floundered until it was made a county seat in 1818; thus stimulated, it made some progress; faltered between 1822 and 1828; advanced during the next decade (hinterland settlement, flat-boat trade, locus of a branch of the State Bank, hopes and immigration encouraged by the Indiana Internal Improvement Bill passed in 1836, which designated Evansville as terminus of the Wabash and Erie Canal and the Central Canal to lead from Muncie through Indianapolis to the White River and the Wabash and Erie

Footnotes continued

Canal); slumped in the panic of 1837-38 and the frustration of the canal projects; advanced steadily after 1846 (natural resources, renewed provision for the Wabash and Erie Canal, plan for a railroad, both consummated in the early fifties, immigration, steamboat services); was retarded and then stimulated by the Civil War; and made steady progress thereafter until the boom of World War I, and the recession of Great Depression I in the early thirties.

TABLE 63
MANUFACTURINGNESS^a

Items Compared	Quotient
1. <u>Developed Mfg. acreage (about 491)</u> , per cent Acreage of the city (about 6,080)	8
2. <u>Developed Mfg. acreage (about 491)</u> , per cent Acreage of main business district (about 70)	701
3. <u>Value added by Mfg. (\$41,633,192)</u> Developed manufactural acreage (about 491)	\$84,793
4. <u>Gainfully occupied in Mf. (15,912)</u> , per cent Gainfully occupied in the city (42,740)	37
5. <u>Gainfully occupied in Mfg. (15,912)</u> Population of the city, 1930 (102,249), per cent	16
6. <u>Estimated people supported by Mfg. (40,000)</u> , per cent Population of the city, 1930 (102,249)	39
7. <u>Value added by Mfg. (\$41,633,192)</u> Gainfully occupied in Mfg. (15,912)	\$ 2,617
8. <u>Value added by Mfg. (\$41,633,192)</u> Population of the city, 1930 (102,249)	\$ 407

^aData mostly from Bureau of the Census, Fifteenth Census of the United States, Manufactures, III, and Population, IV.

Table 63 presents ratios indicating the degree to which Evansville concentrated upon manufacturing, in 1929. For a city of 100,000 it was a bit high.

TABLE 64
 GROUNDS VS. CITY ADDITION^a

Date of Addition	Manufactural Grounds			
	Per Cent of Total Number	Per Cent of Total Acreage	Per Cent of the Acreage of the Addition	Average Size
1817 ^b . . .	1.7	0.9	5.7	0.18
1837 ^c . . .	4.3	2.8	6.4	1.54
1840-1849.	6.7	3.5	6.9	1.34
1850-1859.	11.7	4.7	7.5	1.00
1860-1869.	12.7	2.9	2.7	0.56
1870-1879.	24.4	17.8	8.6	1.82
1880-1889.	0.5	0.1	0.4	0.23
1890-1899.	14.2	32.4	13.0	3.70
1900-1909.	0.0	0.0	0.0	0.0
1910-1919.	6.7	15.8	5.9	5.99
1920-1929.	1.5	6.1	8.6	9.96
Peri-urban	5.6	13.0		5.81

^aData based upon Figure 17 and primary information.

^bEvansville platted as of 1817.

^cLamasco as platted in 1837 (added to Evansville in 1857).

Table 64 presents the distribution and size of developed factory grounds according to additions to the city. In general the younger additions have the greater percentage of the manufacturing acreage and the larger factory grounds.

TABLE 65
 BUILDING-YARD PATTERNS^a

Classes of Patterns ^b	Number of Plants of Each Class in Each Manufacturing Group ^c									
	1	2	3	4	5	6	7	8	9	Total
Solid.	12	15	6	15	1	11	14	4	6	84
Peripheral. . .	8	6	3	0	1	0	0	0	0	18
Central. . . .	4	3	0	3	3	1	0	0	0	14
Lateral. . . .	21	11	0	10	4	0	1	1	4	52
Heterogeneous.	13	4	0	5	4	0	1	0	2	29
Total. . . .	58	39	0	33	13	12	16	5	12	197

^aData based on primary information.

^bFor depiction of these patterns turn to Figure 3; for definition turn to footnote in Chapter IV.

^cThe nine manufacturing Groups are numbered consecutively, as in Table 2, and throughout this treatise.

TABLE 66
SIZE OF GROUNDS^a

Manufactural Group ^b	Manufactural Grounds: Acreage and Relative to City Block						
	By Quartiles (Acres)				Number of Plants		
	Upper	Median	Low- er	Mean	Between 1/2 and 1 Block	Less Than 1/2 Block	Greater Than 1 Block
1. Wood	4.2	1.7	0.7	3.3	19	23	17
2. Metals-alloys	2.8	1.2	0.2	3.1	11	20	8
3. Tobacco . . .	0.3	0.2	0.1	0.6	1	5	0
4. Food materials	2.1	0.4	0.2	1.9	2	23	8
5. Textiles- clothing- leather . .	0.8	0.3	0.1	0.8	1	10	1
6. Stone-clay- sand-coal .	7.0	6.0	0.5	4.0	3	6	7
7. Paper-printing materials .	0.4	0.1	0.04	0.4	1	13	1
8. Chemicals . .	0.4	0.3	0.1	1.0	1	4	0
9. Other materials .	2.6	1.6	0.5	2.1	5	5	5
Total . . .	4.1	0.8	0.3	2.5	44	109	44

^aData based upon Court House records, insurance maps, and field work.

^bGroups are numbered as in Table 2.

Table 66 presents the size of the developed manufacturing grounds by Groups, as of 1933. The maximum sizes by Groups were as follows: (1) 25.4; (2) 30.4; (3) 2.5; (4) 15.4; (5) 5.4; (6) 10.3; (7) 2.8; (8) 4; and (9) 7.0.

TABLE 67
SPATIAL SETTING^a

Manufactural Groups	Number of Plants	Per Cent of All Plants	Per Cent of Total Floor Acreage	Per Cent of Total Ground Acreage	Percentage Ratio of Ground Space to Ground Acreage ^b
1. Wood. . .	59	30	34	39	31
2. Metals and alloys.	39	20	27	25	43
3. Tobacco .	6	3	2	1	85
4. Food materials	33	17	12	13	26
5. Stone, sand, clay, coal. .	16	8	8	13	26
6. Textiles, cloth, leather	12	6	8	13	26
7. Paper and printing	15	8	2	1	37
8. Chemicals	5	2	1	1	12
9. Other materials	12	6	10	5	52
Totals	197	100	100	100	36

^aBased chiefly upon primary information.

^bGround space is acreage under factory buildings.

Table 67 presents the manufactural Groups of Evansville in their spatial setting, as of 1933. For illustration turn to Figure 3.

TABLE 68
FLOOR SPACE^a

Manufactural Group	Manufactural Gross Floor Space (Acres)				
	By Quartiles				Group Total
	Upper	Median	Lower	Mean	
1. Wood.	1.5	1.1	0.6	1.5	88.5
2. Metals-alloys .	2.0	0.9	0.2	1.8	71.1
3. Tobacco	2.0	0.3	0.1	1.0	6.2
4. Food materials.	0.8	0.5	0.2	0.9	30.6
5. Stone-clay-sand-coal.	1.7	0.8	0.3	1.4	22.0
6. Textiles-clothing-leather .	1.2	0.4	0.3	0.9	10.5
7. Paper-printing materials . .	0.3	0.2	0.1	0.3	4.6
8. Chemicals . . .	0.2	0.1	0.1	0.3	1.5
9. Other materials	2.0	0.9	0.4	2.0	24.2
Totals. . . .	1.4	0.7	0.2	1.3	259.0

^aData are based chiefly upon insurance maps, questionnaires, and primary information.

Table 68 presents the gross floor space of manufacturing plants by Groups, as of 1933.

The total floor space does not include basements. They were used much in the operations of the breweries. Other industries making considerable use of basements were printing establishments, bakeries, and creameries.

The maximums for the Groups were as follows: (1) 12.1 acres; (2) 21.5; (3) 4.5; (4) 7.5; (5) 6.1; (6) 3.0; (7) 1.4; (8) 1.0; (9) 10.0.

The number of plants the buildings of which had a maximum height of 7 stories was 1; 6 stories, 0; 5 stories, 3; 4 stories, 16; 3 stories, 39; 2 stories, 81; and 1 story, 54. Three factories were of the loft type, i.e., the ground floor was not used for manufacturing. Turn to Figure 3.

TABLE 69
ROOMINESS^a

Arrays of Categories	Per Cent of Each Category's Plants in Classes Based on Roominess ^b			
	76-100	51-75	26-50	1-25
Cigars.	100	0	0	0
Breweries	100	0	0	0
Bakeries (wholesale).	86	14	0	0
Printing and publishing	79	21	0	0
Enamelling and metal plating. . .	50	25	25	0
Agricultural implements	34	33	33	0
Architectural, structural, orna- mental, steel and iron.	34	33	0	33
Dairy and creamery products . . .	33	67	0	0
Clothing.	67	0	33	0
Foundry and allied products . . .	0	57	43	0
Saw mills	25	25	25	25
Machinery and machine parts . . .	17	33	33	17
Boxes and crates.	29	14	43	14
Monuments and cut stone	33	0	34	33
Planing-mills	10	20	60	10
Furniture	14	11	61	14
Flour-mills	0	33	34	33
Automobile bodies and parts . . .	0	0	100	0
Slaughtering and meat-packing . .	0	17	0	83
Brick and tile.	0	0	25	75

^aData based largely upon primary information, and Figure 3.

^bRoominess is defined as: the percentage ratio of ground-floor space to area of grounds.

Table 69 presents arrays of outstanding categories according to the roominess of the factory grounds, as of 1933. There is an array of 5 categories in which the manufactural ground is almost entirely covered with factory buildings, i.e., they are in the class, 76-100 per cent. There is an array of 5 categories with distinctly roomy grounds. Finally, a larger array exhibits heterogeneity in roominess.

Among the factors affecting the frequency-distribution of the factories in the roominess-classes are: degree of operational requirements for yard space (apparently most important); locality in the city; ease of acquiring parcels of land when and where the plant was established; provision for possible expansion; and age of the plant.

TABLE 70
EVANSVILLE OCCUPATIONAL STRUCTURE^a

Occupation	Persons Ten Years or Older En- gaged in Gainful Occupations		
	Male Number	Female	
		Number	Per Cent
All gainful occupations. . . .	31,525	11,220	26
Manufacturing.	13,071	3,901	23
Chemical and allied industries	323	57	15
Cigar and tobacco factories .	197	1,667	90
Clothing industries	120	407	77
Bakeries.	326	28	8
Slaughtering and meat packing	354	49	12
Other food and allied indus- tries	558	197	26
Automobile factories and re- pair shops.	2,078	217	10
Iron and steel industries . .	3,007	258	8
Metal industries, except iron and steel.	172	25	13
Shoe factories.	10	1	9
Other leather industries. . .	39	4	9
Lumber and furniture indus- tries	3,223	202	6
Printing, publishing, en- graving	386	78	17
Paper and allied industries .	39	13	25
Textile industries.	94	170	64
Electrical machinery and supply factories.	153	10	6
Potteries	192	48	25
Other manufactural industries	1,048	470	31
Independent hand trades. . . .	163	170	51
Building industry.	2,564	53	2
Construction and maintenance of streets	145	1	0
Garages, greasing, stations, etc.	338	14	4
Steam and street railroads . .	2,245	65	3
Telegraph and telephone. . . .	283	319	53
Other transportation (includ- ing postal).	802	29	3
Banking and brokerage.	348	141	29
Insurance and real estate. . . .	535	151	3
Automobile and filling stations	501	24	5
Wholesale and retail trade except automobile.	4,389	1,507	26
Coal mine operatives	466	10	2
Other extraction of minerals (including sand, clay)	99	12	11
Hotels, restaurants, boarding houses, etc.	595	669	53

TABLE 70--Continued

Occupation	Persons Ten Years or Older Engaged in Gainful Occupations		
	Male Number	Female	
		Number	Per Cent
Laundries, cleaning, pressing.	257	347	57
Other domestic and personal service.	679	1,998	74
Recreation and amusement.	259	100	28
Other services, professional, semi-professional.	1,079	1,401	56
Other and not specified industries.	1,907	351	15

^aData are based largely upon Bureau of the Census, Fifteenth Census of the United States: 1930. Population, Vol. IV (Washington: Government Printing Office, 1933).

Table 70 presents the setting of Manufactural Evansville in the occupational structure of Evansville, as of 1930 largely.

Manufacturing dominated on the basis of persons gainfully employed (wage earners plus salaried officials and employees); but the gross value of manufactured products was less than the dollar volume of trade (wholesale plus retail).

The average percentage of women employed in manufacturing was in close alignment with that of all gainful occupations, although certain manufactural categories, employed a large percentage of women.

In 1930 Evansville's population consisted of 49,480 males and 52,769 females. The male gainful workers constituted 60 per cent of their sex, and the women 21 per cent of theirs. The occupational numbers by large divisions were as follows: Agriculture, 563; forestry and fishing, 25; extraction of minerals, 565; manufacturing, 15,912; other mechanical industries, 2,995; transportation and communication, 3,942; trade, 6,459; public service (n.e.s.) 795; professional service, 2,582; domestic and personal service, 4,736; clerical occupations, 4,166; total, 42,740. (The discrepancy in the two sets of figures for manufacturing, 16,972 versus 15,912, lies in variance in classification.)

TABLE 71
RECEIPTS VIA CANAL^a

Commodity	Quantity
Flour.	Barrels 45,923
Pork	6,464
Corn	Bushels 122,594
Oats	24,565
Wheat.	255,738
Coal	154,819
Animals, except hogs	Pounds 255,426
Live hogs.	80,971
Bacon and pork	3,298,232
Baggage and furniture.	21,280
Butter	12,747
Eggs	158,747
Hay.	1,487,328
Pig iron	1,383,456
Cast iron.	30,023
Machinery.	51,557
Carpenters and joiners work.	134,974
Shorts and ship stuff.	476,859
Tobacco.	3,754,961
Hoop poles	296,146
Staves and headings.	Number 695,327
Shingles	Number 723,698

^aData via Indiana Historical Society, Indiana Historical Publications Vol. 8, No. 7, by Daniel W. Snepp, Evansville's Channels of Trade and the Secession Movement 1850-1865 (Indianapolis, 1928), pp. 384-85, in which he quotes parts of the "Annual Report of the Board of Trustees of the Wabash and Erie Canal," appearing (complete) in the Indiana Documentary Journal (1853-59).

Table 71 presents a list of principal commodities selected from a list of 60 items which arrived at Evansville, conveyed on the Wabash and Erie Canal from August 1, 1853, to the close of navigation in the year, 1859. The canal handled chiefly bulky and slowly-moving freight. The arrivals consisted largely of farm products, pig-iron, and building-materials. The list helps to portray the role of the area north of the Ohio River as a supply area for Evansville during the 1850's. In general Covington, Indiana, was the northern limit of Evansville's canal supply-area.

TABLE 72
OUTGO VIA CANAL^a

Commodity	Quantity
Lime.	Barrels 9,324
Salt.	29,543
Whiskey	2,650
Wheat	Bushels 3,092
Agricultural implements	Pounds 115,738
Bacon and pork.	16,698
Baggage and furniture	230,808
Cordage	262,611
Candles	19,676
Cotton yarns.	22,451
Crockery.	166,704
Dye stuffs.	10,499
Glass and glassware	116,438
Pig iron.	30,000
Bar iron.	430,367
Cast iron	552,280
Leather	17,935
Coffee.	521,621
Machinery	398,584
Lead.	10,992
Molasses.	2,654,988
Millstones.	62,166
Carpenters and joiners work	49,842
Sugar	1,394,294
Tobacco	76,188
Shingles.	Number 267,575

^aFor source of data, turn to Table 71.

List of principal commodities selected from a list of 60 items which Evansville shipped out on the Wabash and Erie Canal, from August 1, 1853, to the close of navigation in the year, 1859. The clearances included hardware, groceries, drygoods, drugs, merchandise, and building materials. The list helps to portray the role of the area north of the Ohio River as a market area for Evansville in the 1850's. In general Covington, Indiana, was the northern limit of Evansville's canal market-area.

TABLE 73

INFLOW VIA RAILROAD^a

Commodity		Quantity
Bran.	Bushels	13,059
Brooms.	Dozens	486
Coal.	Bushels	38,090
Coffee.	Sacks	2,043
Cheese.	Boxes	530
Drygoods.	Boxes	606
Flour	Barrels	26,418
Woodware.	Boxes	802
Hay	Carloads	80
Hay	Bales	1,933
Hides	Bundles	128
Hides	Number	682
Lard.	Kegs	3,066
Lard.	Barrels	284
Merchandise	Boxes	1,952
Pork.	Casks	404
Pork.	Barrels	4,135
Potatoes.	Bushels	11,073
Shoes	Boxes	1,215
Sugar	Boxes	892
Tobacco	Hogsheads	138
Whiskey	Barrels	5,452
Wheat	Bushels	74,972
Corn.	Bushels	225,147

^aData via Indiana Historical Society, Indiana Historical Society Publications, Vol. 8, No. 7, by Daniel W. Snepp, Evansville's Channels of Trade and the Secession Movement 1850-1865 (Indianapolis, 1928), pp. 388-89, in which he quotes statistics from the Evansville Daily Journal (Evansville, 1860).

Table 73 presents a list of principal commodities selected from a list of 45 items conveyed to Evansville by the Evansville and Crawfordsville Railroad in 1860. The list helps to portray the role of the area north of the Ohio River as a supply area for Evansville during the early 1860's. The railroad effected connections at Vincennes and Terre Haute with east-west railroads.

Trends, heralded by the railroad conveyance of 1860, were accentuated by later railroad-developments and by the Civil War. Evansville's distributive business changed somewhat. Groceries from New Orleans largely yielded to groceries from the East, especially New York. Increasingly large shipments of grain, especially wheat and corn, were diverted from the southward flowing trade into the eastward flow, as were animals for slaughtering and meat-packing. Southward movement of hay was hindered by blockade of the Southern rivers. The Federal Government bought a large amount of food, clothing, and equipment. Later, as the Federal armies conquered the western part of the South, increasingly large quantities

Footnote continued

of shipments were sent by Evansville into the South, including drugs, of which Evansville received increasingly large quantities from the Northeast.

The hog business of Evansville is a good example of her consumptive and distributive trade. A small number of hogs arrived, in 1860, in Evansville over the railroad; also some 3,174 kegs and 284 barrels of lard; also some 404 casks and 4,135 barrels of pork. In January and February, 1860, the Wabash River packets contributed to the city 2,475 barrels of port, and 517 kegs of lard. From January to July, 1865, some 2,520 barrels of pork and 471 barrels of lard came into the city, by steamboat, from the Green River Valley. Large quantities were shipped to New Orleans.

TABLE 74
EARLY STEAMBOAT SERVICE^a

Year	Arrivals	Passed without Stopping	In U.S. Service
1861.	1,493	199	6
1862.	1,514	227	0
1863.	1,495	250	901
1864.	2,104	300	456
1865.	2,572	332	333
1866.	2,097	222	1
1867.	2,097	212	0
1868.	2,580	...	0

^aData chiefly from J. W. Foster, Annual Report of the Board of Trade for Evansville in 1867 (Evansville: Journal Steam Printing Company, 1868), p. 59.

Table 74 presents the arrivals at Evansville from January, 1861, to December, 1868.

TABLE 75
LATER STEAMBOAT SERVICE^a

Year	Steamboat Services at Evansville				
	Official Agencies	Steamboats Registered Evansville	Steam Steel-Barge Freight	Local Barges Chiefly Sand, Coal	Arrivals
1867. .	..	37			2,097
1868. .	..	29			2,580
1869. .	..	34			.....
1870. .	..	47	Date of	Terminals	.....
1871. .	5	54			.....
1872. .	5	..	begin-	existed	.....
1873. .	..	54	ning is	as early	2,575
1874. .	..	..			2,798
1876. .	5	..	lacking	as 1880	.....
1878. .	3	..			.....
1879. .	4	..			.....
1880. .	2	..			.....
1881. .	2	..			.....
1882. .	2	..			.....
1883. .	2	..			.....
1889. .	3	60			.....
1890. .	4	..			.....
1900. .	3	..			.....
1911. .	5	..		Operating	.....
1915. .	5	..			.....
1925. .	..	..	Operating	Operating	.....
1930. .	Ceased	..	Operating		.....
1933. .	..	None		Operating	.....

^aData from local newspapers, histories and directories; also from Congressional Documents, and interviews.

Table 75 presents later steamboat services at Evansville. After the Civil War there was a great decline in steamboat traffic in the interior of the United States; after 1866, a great decline in steamboat building. However, packet service on the Ohio River lingered into the twentieth century, especially service to the Gateway centers. Evansville's great steamboat period was approximately 1835-1876. Improved highway traffic conditioned the extinction of Evansville's last packet service in 1930, with the Green and Barren Rivers. Steam steel-barge freight service is increasing at Evansville.

TABLE 76
TOBACCO WHOLESALERS^a

Year	Hogsheads Shipped (1,000)	Chief Destination
1857.	10	New Orleans ^b
1861.	17	New Orleans
1862.	19	New York
1863.	28	New York
1864.	26	New York
1865.	27	New York
1866.	21	New York
1867.	35	New York
1873.	21	New York
1876.	9	Northeast
1878.	6	Northeast
1880.	2	Northeast
1893.	3	Northeast
1929.	1	Northeast

^aData based chiefly upon three sources: (1) John W. Foster, Annual Report of the Board of Trade for Evansville, Indiana, for 1867 (Evansville: Journal Steam Printing Company, 1868); (2) Charles E. Robert, Evansville, Her Commerce and Manufactures (Evansville, 1874); and (3) Evansville city directories.

^bLargely for export.

Table 76 presents the evolution of the Evansville wholesale tobacco market, in terms of outgoing shipments. The main sources of the tobacco were southern Illinois, southwestern Indiana, western Kentucky and Tennessee (Green River and Cumberland River valleys). Prior to the Civil War the tobacco was shipped chiefly down the Mississippi River to New Orleans, for reshipment to the American East and to Europe. The closing of the Mississippi route during a part of the Civil War and the rise of railroads shunted the current of Evansville shipments of tobacco to New York, for use in the Northeast and for shipment abroad. Evansville yielded gradually to the Henderson, Kentucky, wholesale tobacco market.

The ancestor of the Chicago and Eastern Illinois Railroad conveyed to Evansville tobacco (in 1,000 hogsheads) as follows: .2 in 1857; 1.5 in 1858; 3.2 in 1859; 7 in 1860; and 33.6 in 1867.

TABLE 77
COTTON WHOLESALERS^a

Year	Bales Shipped (1,000)	Chief Destination
1862.	3	New York and Northeast
1863.	3	New York and Northeast
1864.	18	New York and Northeast
1865.	20	New York and Northeast
1866.	36	New York and Northeast
1867.	41	New York and Northeast

^aData from John W. Foster, Annual Report of the Board of Trade of Evansville, Indiana, for 1867 (Evansville: Journal Steam Printing Company, 1868).

Table 77 presents the railroad-reshipment of cotton from Evansville. Almost all of the city's cotton receipts were re-distributed through shipments by rail (i.e., the Evansville and Crawfordsville, ancestor of the Chicago and Eastern Illinois); therefore these statistics provide in effect an overall view of Evansville's cotton wholesales. For example, Evansville's total receipts of cotton in 1867 were 44,814 bales, her total reshipments, 44,564; a small amount of the difference was consumed in the Evansville cotton mill (founded 1866). Evansville began receiving cotton in 1862 (mainly from the Tennessee Basin and Memphis) in the wake of the Civil War, railroad development, and need for available cotton by the North. Weekly sales were held at the market. The wholesale trade in cotton conditioned the founding of Evansville's cotton factory.

TABLE 78
GRAIN WHOLESALERS^a

Periods	Grain and Milled Grain		
	Commodity	Receipts	Chief Sources and Conveyance
1817-1829	Corn Wheat Flour Meal	Small Small Small Minor	For all four commodities: Evansville Tri-State Area (Conveyance by river, road, trail)
1830-1844	Corn Wheat Flour Meal Oats Barley	Large Consid- erable Small Minor Minor	For all six commodities: Evans- ville Tri-State Area, also middle Wabash and middle Green river valleys (flatboat, steam- boat, towboat, wagon)
1845-1864	Corn (bu.) 1853-1859 Jan.-July, '58 Jan.-Feb., '60 1860 Wheat (bu.) 1853-1859 Jan.-July, '58 Jan.-Feb., '60 Jan.-July, '58 Jan.-July, '60 1860 Flour (bbl.) 1853-1859 Jan.-July, '58 Jan.-Feb., '60 Jan.-July, '58 Jan.-July, '60 1860 Oats (bu.) 1853-1859 Meal (bu.) 1860	Large 122,594 4,475 17,379 225,147 Large 255,738 8,641 2,922 336 ^b 245 ^b 74,972 ^b Large 49,923 3,319 1,271 1,495 1,035 26,418 Minor 24,565 Minor 970	For all five commodities: Tri- State Area, also middle Wabash and middle Green river valleys (railed, rivered, canalled). Wabash and Erie Canal Wabash River Wabash River Chicago and Eastern Illinois Railroad Wabash and Erie Canal Wabash River Wabash River Green River Green River Chicago and Eastern Illinois Railroad Chicago and Eastern Illinois Railroad Chicago and Eastern Illinois Railroad
1865-1913	Corn	Vast, later declined	For all four commodities: Evansville Tri-State Area, mid- dle Green River Valley (Chiefly rail)

TABLE 78--Continued

Periods	Grain and Milled Grain		
	Commodity	Receipts	Chief Sources and Conveyance
	Wheat	Considerable, later declined	
	Flour	Considerable, later declined	
	Oats	small	

^aData chiefly from three sources: (1) Daniel W. Snepp, Evansville's Channels of Trade and the Secession Movement 1850-1865 (Indianapolis: Indiana Historical Society, 1928); (2) Charles E. Robert, Evansville Her Commerce and Manufactures (Evansville: Courier Publishing Company, 1874); and (3) J. W. Foster Annual Report of the Board of Trade for Evansville, Indiana, for 1867 (Evansville: Journal Steam Printing Company, 1868).

^bSacks.

Table 78 presents the evolution of the grain and milled grain trade of Commercial Evansville in terms of receipts, sources, conveyances. Although the statistics are fragmentary, they substantiate known general facts. In the early days the commodities were obtained from the Evansville Tri-State Area, and beyond, especially from the middle Wabash and middle Green River valleys. The Civil War and the development of the railways shunted the middle Wabash River commodities largely eastward. In more recent decades most of the Tri-State wheat has been absorbed by the flour-milling industry of Evansville, and most of the corn by animal husbandry.

The large grain receipts of Evansville, and their redistribution, were a favorable setting for the growth of a large flour-milling industry in that city.

TABLE 79
FREIGHT GROUPS OF MANUFACTURAL GROUPS^a

Manufactural Groups	Freight Groups			
	Materials		Products	
	1929	1932	1929	1932
1. Wood.	IV	IV	II	III
2. Metals and alloys	IV	IV	III	III
3. Tobacco	III	III	I	I
4. Food materials.	III	III	II	II
5. Textiles, cloth, leather.	III	III	I	I
6. Coal, stone, sand, clay	IV	IV	IV	III
7. Paper, printing materials	II	II	I	I
8. Chemicals	IV	IV	III	III
9. Other materials	IV	IV	III	IV
All industries	IV	IV	III	III

^aCalculated from multitudinous data from multitudinous sources.

Table 79 presents a classification of the freight Groups of the manufactural Groups. The products incurred a higher percentage of First Class freight than did the materials. Significance of the freight-rate level is stated in Chapter II.

TABLE 80
COMPARATIVE WAGES^a

City	Annual Wage ^b
New York, N.Y.	\$1,904
Rochester, N.Y.	1,707
San Francisco.	1,653
Worcester, Mass.	1,639
Chautauqua County (Jamestown, N.Y.).	1,635
Detroit.	1,599
Boston	1,590
Philadelphia	1,584
Cleveland.	1,497
Los Angeles.	1,489
Grand Rapids	1,442
Chicago.	1,416
Winnebago County (Rockford, Illinois).	1,389
Minneapolis.	1,325
St. Louis.	1,320
Milwaukee.	1,315
Portland, Ore.	1,277
Baltimore.	1,242
Indianapolis	1,213
York, Pa.	1,094
<u>Evansville</u>	1,083
Sheboygan County (Sheboygan, Wisconsin).	1,083
Fulton County (Atlanta, Georgia)	978
Guilford County (High Point, North Carolina, etc.)	923
State of Virginia.	845
New Orleans.	783
Average for the United States	\$1,395

^aData based upon Bureau of the Census: Fifteenth Census of the United States 1930, Manufactures: 1929, Vol. III (Washington: Government Printing Office, 1933).

^bAverage annual wage per furniture factory wage earner, 1929. Such figures, at best, are approximations. However, since the data are the results of calculations consistently uniform, the data are valid for comparative analysis.

Evansville paid less per wage earner, in furniture factories, than the average for the United States; also less than many of the Northern and Western cities; but more than many of the Southern cities. Her wage was in line with her location in the United States; consult Figure 36. Included in the list are many of the chief competitors of Manufactural Evansville, in furniture.

APPENDIX II

NOTES

Section 1. Notes on the Figures

Figure 1.--Use of the Land, Evansville 1933. The base map is a modification of that of the Evansville City Plan Commission.

Figure 2.--Selected Manufactory Grounds, Evansville 1933. The base map is a modification of that of the Office of the County Surveyor. The numbers on the map refer to specific manufactory establishments. But the names are not presented in this abridgment.

Figure 3.--Selected Manufactory Plants, Evansville 1933. The northern portion of the city is shown on 3A; the southern portion, on 3B.

Figure 4.--Topographic Map of Evansville and Vicinity. Photographed from portions of contiguous topographic maps, of the United States Geological Survey. Compare with Figure 5. There are also topographic maps of Evansville, made for the use of the City Plan Commission; they have very small contour intervals.

Figure 5.--Pictorial Relief Map of Evansville and Vicinity. Compare with Figure 4, on the same scale. The darker shadings represent the lower land. From black to light gray the elevations represented are as follows, in altitude feet: (1) below 340; (2) 340-360; (3) 360-380; (4) 380-400; (5) 400-440; (6) 440-480; (7) 480-520; and (8) above 520. Streams are depicted in white. Massed dots in streams represent sand-bars.

Attention is directed to: (1) The Ohio River, in white; (2) the flood-plain with sloughs; (3) Pigeon Creek, which joins the Ohio River; (4) the terrace between Pigeon Creek and the flood-plain (most of Evansville is built upon this terrace); (5) spurs of the bluffs of the Ohio River Valley; and (6) tongues of valley land between the spurs.

When flooded, the Ohio River flows across the neck of its hairpin curve. The flood-plain embraced by the hairpin curve makes impracticable a bridge across the river immediately at Evansville. A railroad bridge spans the Ohio River west of the upland shown in the southeast. A highway bridge spans the river at a point north of this upland. Green River enters the Ohio at a point a short distance upstream beyond the area of this map.

For the margin of flood, 1913, turn to Figure 2.

Figure 6.--View South from the Tower of the Court House. For the location of the court house, turn to Figure 1, F-7, and Figure 2, 1-10. The site of Evansville is a terrace. Attention is directed to: (1) The Ohio River and its flood-plain; (2) a portion of the Central Business District in the central foreground; (3) the water tower of a printing establishment; and (4) the municipal waterworks in the left background.

Figure 7.--View East from the Tower of the Court House.

Attention is directed to: (1) The Ohio River, which impinges against the terrace in a pronounced curve; (2) a portion of the Heterogeneous District in the foreground; (3) bluffs of the Ohio River Valley on the sky line; (4) the white building of the Mead Johnson Terminal, on the bend of the river; (5) West Side, beyond the Terminal; (6) the circular tank of a gas plant in the right background; and (7) the chimneys of a number of factories. Carpenter Street, in the central foreground, trends west and joins NW Second Street, which trends northwest.

Figure 8.--View East from the Tower of the Court House. In the foreground is a portion of the Central Business District, with the streets leading toward the southeast. In the background are residence districts with the streets leading toward the east. In the left and right foregrounds are seen, respectively, a chimney of a brewery, and one of a dairy-produce plant.

Figure 9.--View Northeast from the Tower of the Court House. Attention is directed to: (1) The brewery cited in Figure 8; (2) the depot and the train sheds of the Chicago and Eastern Illinois Railroad, in the right foreground; (3) in the left background, elevators for storage of grain; (4) in the central background, factories in faint outline; and (5) the sky line of uplands in the distance, on the left.

Figure 11.--Distribution of Manufactured Products of Evansville. The chief destination is the territory of the Central Freight Association. It is followed in order by the territories of the Southern, and the Trunk Line, associations. The letters on the map-diagram refer to the following products, as of the early nineteen-thirties:

- | | |
|--|--|
| A. Furniture | Q. Products of saw-mills and planing-mills |
| B. Cigars | R. Other products of wood |
| C. Flour and other mill products | S. Clothing |
| D. Refrigerators | T. Cottons |
| E. Packed meat | U. Other products of textiles, cloth and leather |
| F. Food for infants | V. Pottery |
| G. Packed dairy and poultry produce | W. Vitrified sanitary ware |
| H. Agricultural implements, machinery | X. Other products of stone, sand and clay |
| I. Stoves | Y. Paints and varnishes |
| J. Glass, chiefly bottles | Z. Other food products |
| K. Electrical implements, machinery | A. Beer |
| L. Metal parts, and stampings | B. Brooms |
| M. Structural and ornamental steel and iron products | C. Mirrors |
| N. Other products of metals, alloys | D. Rubber seats |
| O. Boxes and crates | |
| P. Treated railroad ties | |

Figure 15.--Sources of Fuel and Materials for Evansville Manufactures. The chief source is the territory of the Central Freight Association, followed by that of the Southern Freight Association. The letters on the map-diagram refer to the following materials, as of the early nineteen-thirties (as in Figure 11, in general the items near the head of the list represent greater values than those near the foot of the list):

A. Coal	U. Chemicals: oils, waxes, tar products, alcohol, silver nitrate, etc.
B. Natural gas	V. Paint, varnish, lacquer
C. Hardwood	W. Rubber and rubber products
D. Other wood	X. Sugar
E. Iron, steel	Y. Printing supplies
F. Tobacco	Z. Upholstering supplies, filler
G. Winter wheat	<u>A.</u> Soy beans for flour
H. Animals	<u>B.</u> Monumental stone
I. Dairy and poultry produce	<u>C.</u> Limestone
J. Vegetables and fruit	<u>D.</u> Plate glass
K. Cloth	<u>E.</u> Tin plate
L. Cotton	<u>F.</u> Paper and cartons
M. Leather	<u>G.</u> Coffee
N. Broom corn	<u>H.</u> Cod products
O. Common gravel, sand, and clay	<u>I.</u> Emery
P. Moulding sand	<u>J.</u> Coke
Q. Sand for glass	<u>L.</u> Other items
R. Copper, brass	
S. Aluminum and white lead	
T. Clays and minerals for pottery, vitrified sanitary ware	

Figure 18.--Land Use District Map of Evansville 1924. Zone ordinances regulate the use of the land in the various districts. Erection of buildings for manufactural purposes is prohibited in districts A and B. in district C is prohibited the erection of buildings for "any kind of manufacture or treatment other than the manufacture or treatment of products clearly incidental to the conduct of a retail business conducted on the premises." Manufacturing of a "light industry" type is not prohibited in district B. Manufacturing, therefore, will not be permitted to spread in the southeast, and in the residence district A of the Railroad Ellipse. (Permission of the Evansville City Plan Commission.)

Figure 22.--Ohio River Highway Bridge. It spans the river near Henderson, Kentucky. A causeway on the flood-plain connects the bridge with Evansville, where bridgmen are impracticable owing to the broad expanse of low land on the Kentucky side of the river. (Courtesy of George Dewies.)

Figure 23.--Key sites in the founding of Evansville. They are the sites of the levee (normal river stage), and the mouth of Pigeon Creek, seen a bit to the right of the Mead Johnson Terminal (large, white structure in the central background). The view (1932) is downstream. A terminal for sand and gravel is downstream near the barges. (Courtesy of George Dewies.)

Figure 33.--Competition against Manufactural Evansville 1933. The letter symbols on the map-diagram refer to the following items:

A. Furniture	F. Seats and tanks
B. Lumber	G. Automobile bodies
C. Veneer	H. Planing-mill products
D. Caskets	I. Boxes
E. Coopership	K. Mechanical refrigerators

M. Excavating machinery	A. Electrical machinery
N. Agricultural implements and machinery	B. Cigars
O. Stoves	C. Packed meat
P. Metal beds	D. Dairy and poultry produce
Q. Hand tools	E. Canned vegetables
R. Tools and dies	F. Coffee and spices
S. Malleable castings	G. Pottery and vitrified sanitary ware
T. Casters and other furniture hardware	H. Bricks
U. Bottle caps	I. Glass
V. Steel scaffolding	J. Cotton goods
W. Structural and ornamental steel and iron	K. Men's clothing
X. Equipment, and parts for machinery	L. Mattresses
Y. Electroplating	M. Awnings, tents, and canvas covers
Z. Metal stampings and enameling	N. Paint
	O. Rubber seats
	P. Mirrors
	Q. Brooms
	R. Beer

Figure 35.--Ranking of Evansville among Cities of Its Class 1929. It is portrayed most significantly in the upper right hand corner (VII, Group of 74 Cities in Volumes I-VI). Wide black bands represent compression of the graphs. Evansville ranked (a) notably low in the item, cost of fuel and purchased electricity, and (b) notably high in the item, number of manufactural wage earners. Figure 35 is a graphic representation based on part of a long and intricate tabular study in the unpublished monograph.

Section 2. Notes on the Tables

Table 17.--Wholesaling 1857. The total retail trade was much less than the total wholesale trade, both in value and in areal extent. The wholesale trade (a) was large (river and canal-borne exports for 1857 were estimated to be \$6,082,876), much larger than the manufactural production; (b) originated largely in the Evansville Tri-State Area, plus considerable from the South, and less from the Northeast (Cotton and tobacco, from the Cumberland and Tennessee valleys, did not as yet move to Evansville, and the Northeast had not as yet captured Evansville's import of groceries, etc.); and (c) consummated very largely in the Tri-State and the South, with some shipments North, and minor ones (leaf tobacco and salt) Northeast.

Table 18.--Wholesaling 1867. The total retail trade was much less than the total wholesale trade, both in value and in areal extent. The wholesale trade of Evansville, at the time, (a) was large, larger than the manufactural production; (b) originated largely in the Evansville Tri-State Area and the Northeast, plus tobacco from the Cumberland River Valley, and cotton via the Tennessee and Mississippi rivers; (c) consummated largely in the Tri-State and the South, plus substantial shipments of cotton and tobacco to the Northeast.

The trade had surpassed that of 1857, despite the depression in the early phases of the Civil War, which conflict had disrupted the importation of groceries and produce from New Orleans,

and had shifted the source mainly to the Northeast. The railroads had been a factor in aligning the Wabash Valley with New York instead of New Orleans (export of agricultural products and provisions, import of groceries, hardware, and drygoods). Thus Evansville suffered a loss as a distributing center. During the Civil War the Evansville hog-packing industry suffered greatly; many hogs thereafter were railed from eastern portions of the Tri-State Area to the slaughtering and packing concerns in Cincinnati; others were packed at convenient rail centers, and shipped to New York.

Table 23.--Births and Deaths 1817-1929. Remarks: Period 1817-1929 was an incipient manufactural stage, in line with the slow start of the village. Period 1830-44 was an infantile stage, in keeping with a spurt by the town, followed by an epoch of faltering. Period 1845-64 was a vigorous, adolescent stage, marked by vigorous growth, as the city struck its stride. Period 1865-1913 was a multitudinous stage, related to the sturdy growth of Evansville in its role as a railroad-river gateway distributing center. It had an uncommonly large wholesale area, which was uncommonly distant from large competing centers. Period 1914-33 was a tidal stage, while Evansville fluctuated upward in the floods of World War I, and Great Boom I, only to lose much of its gains in the ebbs of the post-war depression, and Great Depression I climaxing in the early thirties.

Table 27.--Freight-territory Trade. Table 27 presents the estimated ranking of railroad freight-territories, by periods, in (1) buying from Manufactural Evansville, and (2) selling to her.

The railroads and the Civil War increased Manufactural Evansville's contact with the North and the Northeast. Economic changes in the South have tended to lessen Manufactural Evansville's sales contact with it; but the down-Mississippi River shift in the sources of hardwood logs and lumber have tended to increase Manufactural Evansville's purchase contact with the South (offset, however, by the increasing reliance of Evansville upon the manufactural North for many of its materials).

The Evansville Tri-State Area, which comprises a part of the leading two territories, has played an important role in Manufactural Evansville's imports, but minor role in her exports.

Table 31.--Locality vs. Categories. Table 31 presents the distribution of manufactural plants, by city locality and by categories, as of 1933.

Five locality parts of Evansville are utilized. The term, downtown, refers to the three business districts of Evansville which exist in the present city because Evansville became an amalgamation of three towns: Evansville, Lamasco, and West Side. The term, near-downtown, refers to zones, or belts, contiguous to, or embracing, the downtown locality. In Evansville it includes a large portion of the Heterogeneous land-use district, which developed between the cores of Evansville and Lamasco. In Chicago, near-downtown is contiguous to the Loop, and is strikingly a heterogeneous district. The peri-urban plants are brick-yards and abattoirs, located a short distance beyond built-up Evansville.

In general, the downtown and near-downtown localities of Evansville reflect forces mainly centripetal, whereas the outer parts are in line with forces mainly centrifugal. There is an ar-

ray of plants mainly downtown in locality, e.g., printing and publishing; an array mainly near-downtown, e.g., monuments and cut-stone; a third array predominantly intermediate, illustrated by saw-mills; and a fourth array mostly peripheral, e.g., furniture and meat-packing. Finally, there is also a list of plants with heterogeneous distribution, e.g., flour-mills, and planing-mills.

Conveyance ways constitute the prime factor influencing the distribution of factories in Evansville; but locality in the city is a strong factor also. There are minor factors.

Table 32.--Locality vs. Groups. Table 32 presents the locality distribution of plants, by manufactural Groups, in Evansville, as of 1933.

The localization is not as pronounced by Groups as by categories. But the first four Groups are partial to the chief business districts and their vicinities, whereas the last two Groups tend to avoid them. A few of the plants are represented in two Groups, as, for example, the Serval plant, which operated in both lines. Therefore, the total plants are 208, instead of 197 separate plants.

Table 33.--Locality vs. Age of Firms. Table 33 presents the distribution of the plants of Evansville, by locality parts of the city, according to the ages of the firms occupying them, as of 1933.

Most of the firms have persisted with moderate changes since the date of their organization; some have been reorganized to carry on in the same line of manufacturing; in a few instances a second firm has taken over the plant to continue the line of manufacturing, or a mutation thereof.

Despite masking by other factors, such as conveyance routes, there is considerable correlation between the ages of the plants' firms and their locality in the city, specifically its five parts recognized in the table. The older firms tend to be located downtown, or near-downtown; and the younger firms tend to be located in locality parts of the city lying farther out.

Example: Of the firms from 51-100 years old, 82 per cent were located downtown or near-downtown; of the firms from 1-50 years old, 45 per cent were located downtown or near-downtown. The corresponding percentages of firms 71-100 years old, and 1-30, are 90 per cent and 45 per cent. The evidence of this tendency would become more striking if the number of the plants were weighted according to manufactural wage earners, gross production, yard acreage, and floor space.

Among the contributing factors to such localization are the following: The younger firms prefer marginal locations (except in cases of distinctly centripetal enterprises, such as printing, and in other cases, such as milk-creamery-ice cream, which firms sell most of their products within Evansville), due in part to improved transportation and to advantages of roomy grounds, and one-story plants. The older, more conservative, firms are less likely to move outward from inner locations. Few firms move from outer to inner sites (which would add younger blood to the inner districts). The business districts and the margins of the city have expanded outward, and thus engulfed some of the older plants.

Most of the manufactural firms of Evansville were relatively

young in 1933, when 56 per cent of the plants were run by firms from 1-30 years old. The influence of World War I and Great Boom I is apparent.

Table 34.--Locality vs. Markets. Table 34 presents the distribution of manufactural plants of Evansville, classified into classes on the basis of location of majority sales (at least 60 per cent), as of 1932.

Example: Of the 67 Evansville plants which sold chiefly in that city, 48 per cent were located downtown. The plants which sold chiefly in Evansville were located mainly downtown and near-downtown (70 per cent). The plants which sold chiefly beyond the Evansville Tri-State Area were congregated mainly in intermediate and outer parts of the city (71 per cent). The correlation between (1) locality in the city and (2) accessibility to market is apparent.

Table 35.--Locality vs. Railroad Sidings. Table 35 presents the distribution of factory grounds having railroad sidings (railway or street freight-railway), and having none, as of 1933. Indicated also is the distribution of manufactural wage earners of such factories, as of 1929.

There was correlation between the locality parts of Evansville and such grounds. Only 23 per cent of the grounds with sidings were located downtown and near-downtown; whereas 76 per cent of the grounds without sidings were located thus. The correlation is evident also when viewed in terms of associated manufactural wage earners.

The centrifugal effects in the intermediate versus the peripheral part are blunted somewhat by (a) the railroad pattern with its high percentage of mileage in the intermediate part, and by (b) the fact that some of the factory sites now intermediate were originally peripheral.

Table 36.--Locality vs. Roomy Grounds. Table 36 presents the distribution of manufactural plants on the basis of percentage of grounds covered by the factory to the acreage of the factory grounds, as of 1933.

The data reveal a strong correlation between the degree of roominess of the grounds to the locality in the city, specifically the five parts appearing in the table. With some exception there is concentration of the roomier grounds in the outer parts of the city; and there is concentration of the crowded grounds in the inner parts, especially in and near the business districts.

Example: Some 75 per cent of the more crowded grounds (percentage ratios of 51-100 per cent) are downtown and near-downtown, whereas some 84 per cent of the more roomy grounds (percentage ratios of 1-50 per cent) are in the intermediate, peripheral, and peri-urban parts. For the group of greatest crowding (ratios of 76-100 per cent), and of the least crowding (ratios of 1-25 per cent), the corresponding percentages are 84 and 92.

Table 37.--Locality vs. Furniture Plants. Table 37 presents the distribution of the furniture manufactural plants of Evansville on the basis of the percentage ratio of the building-covered area to the total ground acreage of the plant, as of 1933.

Some 86 per cent of all of the plants were located in the

intermediate and peripheral parts of the city; and of these 24 plants, five-eighths were of roomy grounds, but only one-sixth were of the most roomy type.

In summation, the furniture plants were congregated largely (1) near the railroads, (2) in the outer parts of the city, and (3) in the type of moderately-roomy manufactural grounds.

Table 40.--General Bailiwick Pattern. Table 40 presents the classification of manufactural plants of Evansville by bailiwicks (back-log areas), as of 1933 (except automobiles bodies and parts, and excavating machinery, which are as of 1929).

Example: Some 81 plants had their mainstay sales in the local bailiwick, namely, Evansville plus its Tri-State Area. These plants comprised roughly 44 per cent of all of the manufactural plants, and they employed roughly 11 per cent of all of the manufactural wage earners of Evansville as of 1929.

Table 41.--Purchases Patterns by Groups. Table 41 presents the classification of manufactural plants by Groups and by purchases-bailiwicks, as of 1933 (except automobile bodies and parts, and excavating machinery, which are as of 1929).

Example: The plants of the wood Group which bailiwicked in Bailiwick I (Evansville plus its Tri-State Area) constituted some 16 per cent of all of the plants which bailiwicked in purchases from Bailiwick I. This portion of the plants of the wood Group also constituted some 8.5 per cent of the plants of that Group. This same portion of the plants of the wood Group employed some 15 per cent of the manufactural wage earners of that Group, and 1.1 per cent of the total manufactural wage earners of Manufactural Evansville, as of 1929.

Table 42.--Sales Patterns by Groups. Table 42 presents a classification of manufactural plants by Groups and by sales-bailiwicks, as of 1933 (except automobile bodies and parts, and excavating machinery, which are as of 1929).

Example: The plants of the wood Group which bailiwicked (in sales) in Bailiwick I constituted some 21 per cent of all of the plants which back-logged in sales in that bailiwick. This portion of the plants of the wood Group also constituted some 25 per cent of the plants of that Group. This same portion of the plants employed some 22 per cent of the manufactural wage earners of all of the plants which had their mainstay sales in Bailiwick I; and, furthermore, 7 per cent of the total manufactural wage earners of that Group, and 2.7 per cent of the total manufactural wage earners of Evansville, as of 1929.

Table 43.--Purchases Patterns by Categories. Table 43 presents a classification of manufactural plants by categories and by purchases-bailiwicks, as of 1933 (automobile bodies and parts, and excavating machinery are as of 1929). Purchases of fuels are excluded because they were almost wholly from mines near Evansville.

There is an array of 12 categories, e.g., bricks and tile, whose purchases-bailiwick, for materials, was Bailiwick I. This category included 32 manufactural plants, which constituted 86 per cent of the plants back-logging in Bailiwick I (in purchases), also 83 per cent of the manufactural wage earners working in plants back-logging in Bailiwick I, and 5.8 per cent of all of the manu-

factural wage earners.

Obviously, a category's purchases of materials were not limited to its bailiwick; but the distribution of the arrays in the bailiwicks portray roughly the basis areal-constitutional purchases-pattern of Manufactural Evansville, as of 1933.

Table 44.--Sales Patterns by Categories. Table 44 presents a classification of manufactural plants by categories and by sales-bailiwicks, as of 1933 (automobile bodies, etc., as in Table 43).

Example: There is an array of 17 categories, e.g., whole-sale bakeries, whose sales-bailiwick was I. This category included 70 manufactural plants, which constituted 85 per cent of the plants back-logging in sales in I, also 87 per cent of the manufactural wage earners working in plants back-logging in I, and, also, 9 per cent of all of the manufactural wage earners of Evansville.

Table 45.--Pattern vs. Size. Table 45 presents a classification of manufactural trade patterns by bailiwicks and by size of factory, as of 1933 (automobile bodies, etc., as in Table 43). The criterion for size of plant is employance of manufactural wage earners.

Example: In terms of plants, 50 per cent of the very small ones (less than 26 manufactural wage earners) bailiwicked in Bailiwick II, in purchases, and 65 per cent in Bailiwick I, in sales.

Table 46.--Pattern vs. Ownership. Table 46 presents a classification of the manufactural trade patterns, by bailiwicks and by type of ownership of plants, i.e., intra-Evansville and extra Evansville ownership, as of 1933 (automobile bodies, etc., as in Table 43). About 45 per cent of the manufactural wage earners worked in factories with extra Evansville financial control. Fuel is excluded.

In the trade pattern by bailiwicks, the extra-Evansville owned plants ranged the farther afield. Such ownership stressed rather distant sales and medium distance in purchases, whereas the intra-Evansville ownership stressed medium distances in purchases, and less distance in sales.

Example: In terms of plants, 55 per cent of the extra-Evansville owned plants bailiwicked beyond the Neighborhood States in purchases, and 70 per cent in sales. Some 53 per cent of the intra-Evansville owned plants back-logged in bailiwicks I and II in purchases, and 81 per cent in sales. In terms of manufactural wage earners, 84 per cent of the employance of the "foreign" plants was in plants bailiwicking beyond II in purchases, and 72 per cent in sales; whereas some 23 per cent of the employance of "home" plants was in plants which bailiwicked in I and II in purchases (56 per cent for III), and 71 per cent in sales. Compare with Table 45.

Table 47.--Pattern vs. Raw Materials. Table 47 presents the distribution by bailiwicks, of sources of materials (excluding fuel) purchased by Evansville factories using almost exclusively unmanufactured materials, and by Evansville factories using almost exclusively manufactured materials, as of 1933, largely.

Example: About 59 per cent of the firms utilizing almost exclusively unmanufactured materials back-logged in Bailiwick I,

in their purchases. These firms employed about 27 per cent of the manufactural wage earners working in such factories.

Revealed is some correlation between distance and proportion of unmanufactured materials purchased, although the correlation is masked by the fact that the Evansville tobacco material was obtained distantly (leaf tobacco). Excluding tobacco, the firms stressing the use of unmanufactured materials stressed the use of non-distant bailiwicks. Likewise, the firms stressing the use of manufactured materials emphasized the use of more-distant bailiwicks.

The raw materials were about 30 per cent of the purchased materials, in terms of manufactural wage earners, and about 29 per cent, in terms of the number of factories.

Table 48.--Groups' Freight in Bailiwicks. Table 48 presents the distribution of Manufactural Evansville's freight, by bailiwick areas and by freight-rate Groups, as of 1933. It is assumed that the relative amount of freight, pertaining to a given bailiwick, is roughly proportional to the number of firms bailiwickling in it. The same assumption is made in terms of manufactural wage earners of those firms. The assumption is supported by investigation and experience.

Example: A number of firms bailiwicked, in purchases, in I. Of such firms, 31 per cent were of factories the purchases of each of which classified averagedly into freight-Group II; 3 per cent in freight-Group III; 47 per cent in Group IV; and 19 per cent in Group V.

Correlation seemingly is not apparent between freight-rate Groups and distance of shipment. This finding is probably non-traditional; it challenges further investigation.

There is seeming correlation in one facet: The bulk of the low freight-rate materials comes from afar; the bulk of the high freight-rate materials comes from anear.

Table 49.--Bailiwicks' Freight in Groups. Table 49 presents the distribution of Manufactural Evansville's freight, by freight-rate Groups and by bailiwicks, as of 1933. It is assumed, with considerable backing, that the relative amount of freight pertaining to a given freight-rate Group is roughly proportional to the number of firms, assigned to the Group (on the basis of the freight rates they suffer). Ditto for manufactural wage earners.

Example: A number of firms bought materials which, for each firm, moved predominantly in freight-rate Group III. Of these firms, Bailiwick IV was credited with 10 per cent. The assumption, therefore, is that Bailiwick IV had 10 per cent of the bailiwick trade of freight-rate Group III, and roughly 10 per cent of the purchases trade of that Group. In contrast, when measured in terms of manufactural wage earners, Bailiwick IV was credited with 54 per cent of the purchase trade of Group III. This striking discordance lies in the fact that the few tobacco firms bought large quantities of leaf tobacco from Bailiwick IV. The truth would appear to be between the limits of the spread, 10-54 per cent, in this case nearer to the percentage, 54. Few spreads are so vast. In many cases they are so small as to be, in effect, accordance. For example, Bailiwick IV is credited with 8 per cent of the sales trade of freight-rate Group III, in terms of plants; and 9 per cent, in terms of wage earners.

Table 50.--Factory Trade Patterns. Table 50 presents the percentage distribution of classes of factory trade-patterns in terms of bailiwick-distance of purchases and sales, as of the early 1930's.

Example: Some 15 per cent of all of the factories represented the class which, in terms of bailiwick trade, outstandingly bought materials in Bailiwick I (Ap), and likewise sold anear(As).

Table 51.--Quality of Patterns. Table 51 presents a classification of Evansville factories on the basis of distance of trade areas and alleged favorableness of the manufactural trade-patterns, as of the early 1930's.

Example: About 91 per cent of the factories which bought chiefly from Bailiwick II are opined to have trade patterns clearly favorable toward the success of the factories; about 6 per cent clearly unfavorable; and about 3 per cent, neutral: neither clearly either.

The shorter distances are associated with the higher percentages of favorable patterns, and vice-versa, with exception.

The high fraction of patterns of alleged high quantity attests to the soundness of Manufactural Evansville's trade pattern in general; and it is held to be indicative (not conclusive) that the outlook for her future for decades is, in general, firm.

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ABSTRACT

This dissertation is a study of the evolution of manufacturing in Evansville, Indiana, from 1820 to 1933, with emphasis upon the period, 1929-33. During this long period, the economic role of manufacturing in Evansville advanced from one of insignificance in the city to one of predominance; and more recently this manufactural predominance in the city of Evansville has been increasing in quantity and degree.

The subject of investigation in this study is Manufactural Evansville, i.e., the manufactural component of Evansville, a division comparable with other divisions or components of the city, such as commercial Evansville, residential Evansville, and conveyance Evansville. The physical structures of such divisions occupy space in the land use pattern of the city.

During the period of investigation in the field, and during the preliminary stages devoted to the study of the data obtained, the objective was to derive a rounded picture of Manufactural Evansville, in other words an assemblage of facets, which somehow ought to fit together. Finally out of this mulling, analysis and writing, there emerged three questions, which, in a way, became the problem of the thesis. The first, and major, question was, "Has there been more than a modicum of order inherent in Manufactural Evansville?" An implication of this question was another one, namely, "Is it feasible to develop a sub-science dealing with the manufacturing components of cities?" The second question, a less sweeping one, was, "Is the outlook for future manufacturing in Evansville optimistic?" An implication of this question was also another one, namely, "Can the evolutionary curve of a manufacturing center be discerned?" The third question, the least sweeping of the three, but the most interesting to the manufacturers of Evansville, was, "What would help Manufactural Evansville?" This question can be transmuted into this one, "Is it feasible to plan for the future development of a manufactural component of a city?" The three questions are inter-related. The problem was to derive the answers through a

scientific study of the writer's rather abundant data and generalizations about Manufactural Evansville.

Once the problem was set, the next step was interpretative writing, the results of which are the chapters of this thesis, a chapter each to a field treated, although, of course, some fields were deleted. In addition to a preliminary chapter dealing with status and features, largely analytically descriptive, but also in the nature of forecasts of chapters and topics to come, the four major fields of Manufactural Evansville herewith treated are as follows: (1) The setting of the Manufactural Component, (2) the evolution of the component, (3) the two hundred plants of Manufactural Evansville, treated collectively, and, finally, (4) the trade pattern of Manufactural Evansville.

1) The setting has been examined radially outward: first, locally; then regionally; and last, nationally. The setting is treated as a spur, pregnant with challenge and risk. (2) Interest in the evolution of the manufactural component focusses primarily upon both the course and the stages of the evolution, and secondarily upon the geography of Evansville at the time of the settlement and early growth, with emphasis upon aspects germane to manufacturing. (3) With respect to the two hundred plants, emphasis is placed upon distributional aspects, or, as Platt remarked, "Correlations of factory distribution." The treatment deals with the successive deployment of the plants as the city grew areally, with the alignment of the plants, with the concentration of the factories into manufactural districts, and, finally, with the probable direction of future manufactural areal expansion. (4) Finally, in this treatment of the problem of the thesis, the manufactural trade pattern is examined, from four basic points of view, namely, (a) the trade pattern as a whole, (b) the purchases pattern, (c) the sales pattern, and (d) the purchases-sales pattern in balance upon a fulcrum point, which is manufactural Evansville.

Are the three questions, constituting the main problem of the thesis, answered in the course of the treatment of the five fields, and do the answers grow out of the treatment? The answer is "Yes, to a reasonable degree." Moreover, the answer in each of the three cases is positive.

In this study of manufacturing in Evansville two major conclusions have been reached. The basic conclusion is that dis-

cernible order permeates much of Manufactural Evansville. From this conclusion it might be hypothecated that a sub-science dealing with the manufactural components of cities is feasible. The second conclusion reached is that the time of possible demise of extensive manufacturing in Evansville lies happily remote.

Finally, this study hazards recommendations directed toward the future success of Manufactural Evansville. This recommendation business is a phase of economic fortune telling, based upon scientific analysis and interpretation. The basic recommendation is that steps be taken to insure the raising of the manufacturing level of Evansville. The increasingly critical circumstance at Evansville is that the distance from the source of supplies to Evansville has been increasing, owing to recession in the source of supplies, growing out of depletion. The problem is not yet alarming; but it is growing. The average distance to main supplies is greater than the average distance to main markets. Raising the level of manufacturing in Evansville would, in effect, reduce the incidence of the element, distance, and thus postpone the advent of old age. The chief objective suggested is an increase in emphasis upon the manufacturing increment, i.e., upon the money value added in the process of manufacturing. An important means toward this objective would be increased emphasis upon quality of products, resulting in higher price-class goods. Such goods are less dependent upon the element, distance, than are lower price-class goods, partly because the latter type of goods requires, for success, relatively larger quantities of supplies.

With the preceding paragraphs as background, at this juncture a number of aspects of the abstract can be made more factual in restatement.

Manufactural Evansville may not be a kosmos; but it discernibly is not a chaos.

Manufactural Evansville has evolved. It has attained a stage of maturity nearly climactic (a level of maximum exploitation of potentials), and there are incipient heralds of approaching late maturity (largely due to recession of materials); but rejuvenation has set in. The evolutionary course is parabolical; but it is being extended and, therefore, flattened, by rejuvenation. Late old age appears to be distant.

The curve of Evansville's manufacturing level (the per-

centage ratio of the manufacturing increment to the cost of supplies) measures roughly, and parallels roughly, the evolutionary course of Manufactural Evansville, i.e., it is an extended (flattened) parabolical curve, rising in rejuvenation. The curves of the categories, which comprise the composite curve of Manufactural Evansville, exhibit a characteristic rise and decline inherent in innovation and improvement; also inherent in standardization, competition, and recession of materials; and in other factors. Some of the curves exhibit rejuvenation. Thus the composite curve is a resultant of ups and downs, births and deaths, also mutations, crosses, and selections, of the categories; and of other changes, such as freight rates. The general manufacturing level of Evansville could be raised by transference from great manufactural emphasis upon supplies to increased emphasis upon products--a rise in the money quality of manufacturing. This, to some extent, is happening; it is a major process of the rejuvenation.

There is some discernible order in the manufactural land use pattern. The correlations are with the topography of the site of Evansville; with the land use pattern of the city--especially conveyance ways, also with the evolutionary stages of the districts; and with locality in the city.

There is also some discernible order in the manufactural trade pattern. The sources of supplies have always been chiefly north of the line of the Ohio River. Recently, in line with significant changes, the destinations of products have shifted from south of that line to north of it. The regional relations of the trade pattern are numerous and potent. The manufactural trade with the bailiwicks (back-log areas) exhibits numerous correlations, especially with the item of distance--from resource land, and to destination land. It appears that manufactural categories trading afar experience greater difficulty in maintaining trade patterns favorable toward the success of the factory than do categories trading anear. The general high quality of the supplies-sales patterns of the factories augurs favorably toward the future of Manufactural Evansville.

Combinations of time, place, and peoples have been important in Manufactural Evansville. The kernel, or vortex, is at Evansville, chiefly in the factories. But, in a sense, the inflow of supplies to Evansville and the outflow of products from

it are a part of the manufactural component of the city. They represent chiefly regional relationships, focussing upon points. Also the producers and receivers of such stuffs at the points become, in a sense, a bit Evansvillian. Naturally this combination, with all of its parts and counterparts, is unique. There is an element of self-impellment, not analyzed. Of Manufactural Evansville's setting, the site appears to have been the most stable; the situation, an in-between; whereas the remainder of the setting has introduced the most variables.

